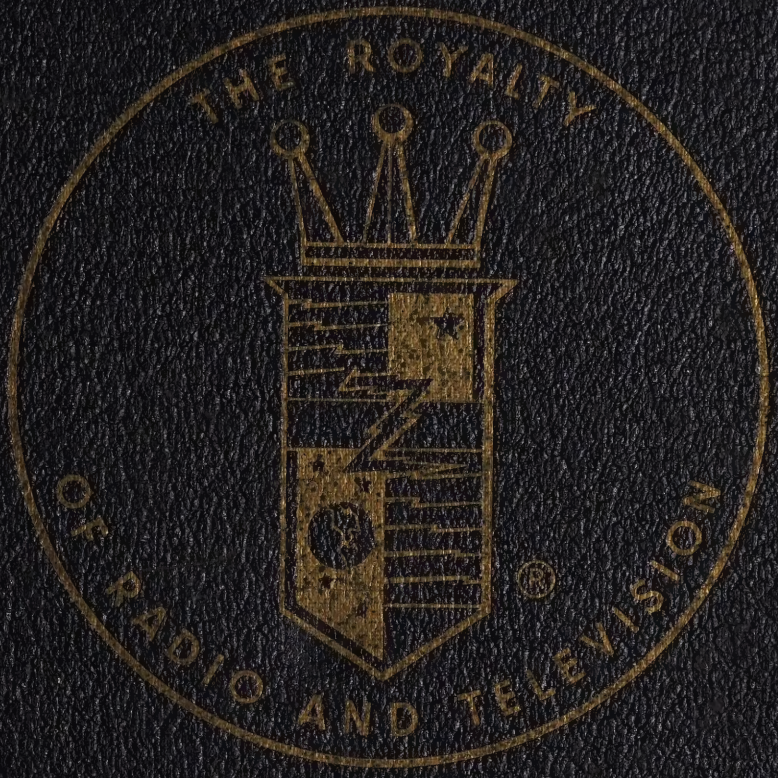


Service Manual

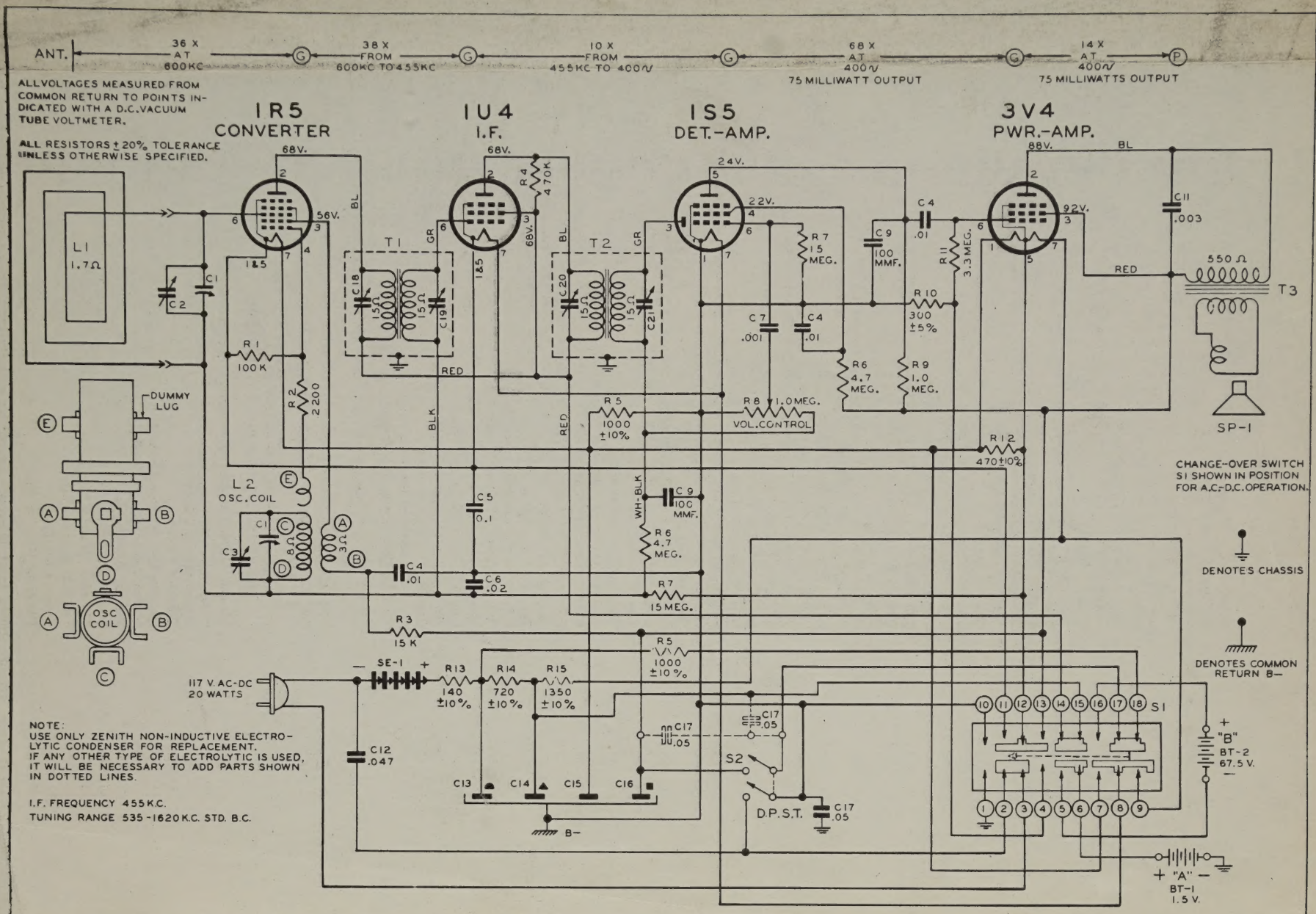
Volumes 3 and 4 combined

PARTS LIST

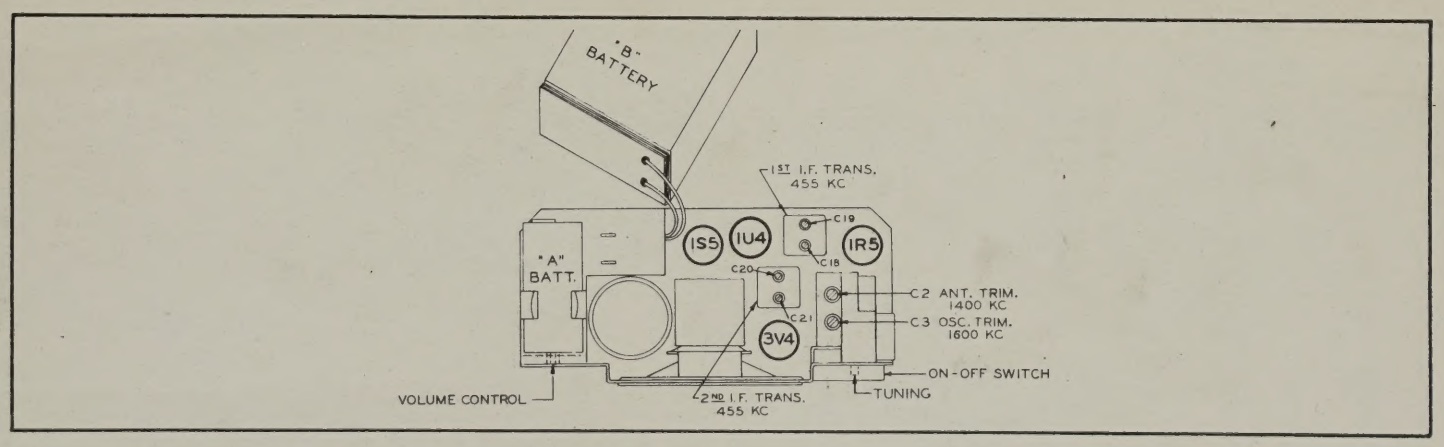
PART NO.	DIAG. NO.	DESCRIPTION		PRICE
		DIAL ASSEMBLY		
12-1374		Volume Control Mtg. Brkt.		$ .08
46-683		Front Cover Latch Knob		.35
46-684		Tuning Control Knob		.06
46-684Y		Tuning Control Knob (W & Y Model only)		.06
46-736		"On-Off" Switch Knob		.05
46-736Y		"On-Off" Switch Knob (Y Model only)		.05
46-736W		"On-Off" Switch Knob (W Model only)		.05
46-737		Volume Control Knob		.10
46-737Y		Volume Control Knob (W & Y Model only)		.10
59-200		Dial Pointer		.10
		COILS & CHOKES		
95-1243	T1	1st I.F. Transformer		2.50
95-1244	T2	2nd I.F. Transformer		2.50
S-13774	L2	Osc. Coil Assembly		.55
		CONDENSERS		
22-3	C4	.01 Mfd. Ceramic (Disc)	500V	.26
22-326	C11	.003 Mfd.	400V	.20
22-827	C5	.1 Mfd.	200V	.23
22-829	C17	.05 Mfd.	200V	.20
22-1386	C6	.02 Mfd.	200V	.20
22-1457	C1	Two Section Variable Cond.		4.00
22-1669	C9	100 Mmfd. Ceramic	500V	.20
22-1676	C7	.001 Mfd. (Molded) (or 22-1343)	500V	.40
22-1775	C12	.047 Mfd. (Molded) (or 22-1756) (or 22-1914)	400V	.26
22-2036	C13,14	Four Section Elect. 40-40-20 Mfd.		
	C15,16	150V - 200 Mfd. 10V		3.25
		RESISTORS		
63-1651	R8	Volume Control		1.20
63-1762	R10	300 Ohm 1/2W 5% Ins. Res.		.21
63-1771	R12	470 Ohm 1/2W 10% Ins. Res.		.21
63-1785	R5	1000 Ohm 1/2W 10% Ins. Res.		.21
63-1800	R2	2200 Ohm 1/2W 20% Ins. Res.		.21
63-1835	R3	15K Ohm 1/2W 20% Ins. Res.		.21
63-1870	R1	100K Ohm 1/2W 20% Ins. Res.		.21
63-1898	R4	470K Ohm 1/2W 20% Ins. Res.		.21
63-1912	R9	1 Megohm 1/2W 20% Ins. Res.		.21
63-1933	R11	3.3 Megohm 1/2W 20% Ins. Res.		.21
63-1940	R6	4.7 Megohm 1/2W 20% Ins. Res.		.21
63-1961	R7	15 Megohm 1/2W 20% Ins. Res.		.21
63-1999	R13	140 Ohm 3W (Zipohm) 10% Ins. Res. (or 63-2014)		.33
63-2024	R14,15	Two Section Candohm		.75
		MISCELLANEOUS		
11-102		Line Cord & Plug		.65
12-1379		Handle Support Brkt. (R.H.)		.07
12-1380		Handle Support Brkt. (L.H.)		.07
14-907		Cabinet for 4G800		2.00
14-907Y		Cabinet for 4G800 (Black)		2.00
14-907W		Cabinet for 4G800 (White)		2.00
19-164		"A" Battery Retaining Clip		.12
24-462		Switch Cover		.08
24-525		Wavemagnet Cover		.50
24-525Y		Wavemagnet Cover (Y Model only)		.50
24-526		Wavemagnet Cover (W Model only)		.50
24-522		Cabinet Cover		1.10
24-522Y		Cabinet Cover (Y Model only)		1.10
24-522W		Cabinet Cover (W Model only)		1.10
43-149		Handle End Pieces (2 used)		1.25
49-665	SP1	3-1/2" P.M. Speaker		4.25
		208-665 Cone & Voice Coil		1.65

MODELS G402, G402Y, G402W & G402G

CHASSIS 4G41



TUBE AND TRIMMER LOCATION



TO THE SERVICEMAN:

Final alignment of the 4G41 chassis should be made with the chassis installed in the cabinet. Tune in a weak station in the vicinity of 1400 KC and adjust the antenna trimmer for maximum.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Sig. Frequency	Set Dial At	Trimmers	Purpose
1	Converter Grid	1 MFD	455 Kc.	600 Kc.	C18, C19, C20, C21	Align I.F.
2	One Turn Loosely Coupled to Wavemagnet		1600 Kc.	1600 Kc.	C3	Set Oscillator To Scale --
3			1400 Kc.	1400 Kc.	C2	Adjust for Maximum.

PART NO.	DIAG. NO.	DESCRIPTION	PRICE
		MISCELLANEOUS Cont'd	
54-254		Speed Nut - Tinnerman (3 used on 83-1416)	.85C
57-1314		Cabinet Front Plate	3.00
57-1315		Chassis Bottom Plate	.50
78-274		Elect. Cond. Socket	.03
78-781		Miniature Tube Socket	.20
78-782		Miniature Tube Socket	.25
80-564		"B" Battery Retaining Spring	.06
80-567		Latch Spring	.02
80-611		Latch Spring	.03
80-612		"A" Battery Front Contact Spring	.03
83-1416		Decorative Strip	.60
83-1417		Rubber Strip - Handle	.10
83-1428		Wavemagnet Retaining Strip	.03
83-1513		"B" Battery Terminal Strip	.25
85-433	S2	On-Off Switch	1.20
85-454	S1	Power Change-Over Switch	2.00
93-870		Fibre Shoulder Washer	.02
93-935		.015 x 7/16" x 3/4" Armite Washer	.01
94-295		Gang Cond. Mtg. Bushing (3 used)	.04
95-1014	T3	Output Transformer	1.65
110-127		Grill Cloth	.15
112-56		#6 x 1/4" Hex Hd. S.T. Screw Cad. (3 used S-15482, 2 used 126-539)	.55C
112-322		#2 x 3/16" Phill. Oval Hd. S.T. Screw (4 used on Wavemagnet & Cover)	.03
112-407		#6 x 3/8" Rd. Hd. S.T. Screw Cad. Pl. (2 used to mount ea. 43-149)	.02
112-685		#4 x 3/16" Flt. Hd. S.T. Screw Cad. (4 used on Wavemagnet & Cover)	.02
112-711		#4 x 1/4" B.H. S.T. Screw Stat. Br. (8 used)	1.20C
113-17		#6-32 x 1/4" R.H. M.S. Steel N.P. (2 used Chassis Mtg.)	.02
114-58		#6-32 x 3/8" Hex Hd. MS Steel (3 used 22-1457)	.43C
125-17		Rubber Grommet (3 used 22-1457)	.03
125-58		Strain Relief Grommet	.15
125-59		Strain Relief Grommet	.15
126-539		Volume Control & Power Switch Shield	.15
199-79		Flexible Handle Sleeve	.30
199-79Y		Flexible Handle Sleeve (Y & W Model only)	.30
202-757		Instruction Book	.20
212-5	SE1	Selenium Rectifier	1.80
S-13777		Power Switch Shield Assembly	.20
S-13786	L1	Wavemagnet Winding Assembly	.75
S-13848		Hinge & Wire Assembly (R.H.)	.50
S-13849		Hinge & Wire Assembly (L.H.)	.50
S-13850		Spring & Insulator Strip Assembly	.06
S-14755		Handle Strip Assembly	.05
S-15485		Shield & Battery Retaining Spring Assembly	.55
S-16125		Bottom Cover & Latch Assembly	.70
		BATTERIES	
Z-67		"B" Battery	
Z-2NL		"A" Battery (or Z-4NL or two Z-3NL)	
		CABINET PARTS for MODEL G402G (Chassis 4G41) ONLY	
14-1252		Plastic Cabt. for G402G Portable Model	2.25
16-561		Packing Carton	
24-551		Wavemagnet Cover	.50
24-552		Cabinet Cover	1.10
43-192		Handle End Pieces (2 used)	1.25
46-868		Front Cover Latch Knob	.40
46-869		Tuning Control Knob	.06
46-870		"On-Off" Switch Knob	.06
46-871		Volume Control Knob	.10
57-1659		Cabinet Front Plate	3.50
83-1793		Decorative Strip	.60
199-139		Flexible Handle Sleeve	.30

Prices shown are suggested list prices and are subject to change without notic

IMPORTANT NOTICE

This service manual has been compiled for your assistance in servicing Zenith receivers. All technical data and parts lists, shown in each individual manual, were compiled at the time of the receiver's manufacture. The listing of parts herein does not necessarily indicate that such parts are still available in our stock.

Prices shown herein were those in effect at the time the receiver was manufactured, and are subject to later changes.

For latest information on service, parts availability and prices, consult your Zenith Distributor whose name will be furnished upon request.

ZENITH RADIO CORPORATION

CHICAGO 39, ILLINOIS

NOTE:

Index for VOLUME 3 on following pages. Index for VOLUME 4 at yellow separator in center of book.

March 1, 1951

IMPORTANT NOTICE

This service manual has been compiled for your assistance in servicing Zenith receivers. All technical data and parts lists, shown in each individual manual, were compiled at the time of the receiver's manufacture. The listing of parts herein does not necessarily indicate that such parts are still available in our stock.

Prices shown herein were in effect at the time the receiver was manufactured, and are subject to later changes.

For latest information on service, parts availability and prices, consult your Zenith Distributor whose name will be furnished upon request.

ZENITH RADIO CORPORATION

CHICAGO 39, ILLINOIS

NOTE:

Index for VOLUME 2 on following pages. Index for VOLUME 1 at yellow separator in center of book.

March, 1951

SERVICE MANUAL III

Volume 3 of the Service Manual contains service information on Zenith receivers and record changers manufactured from 1945 through 1948. Previously published Volumes 1 and 2, which have been recently combined into a single volume, contain service information on Zenith receivers manufactured prior to 1942. The current and past volumes are now obtainable through your Zenith distributor.

In addition to the current data, the complete index of Volumes 1, 2 and 3 and the cross reference of chassis versus serial numbers of Zenith receivers manufactured from 1936 to 1942, is included. The cross reference provides a simple means of determining a chassis and model number from the serial number. This list also indicates the page and volume in which the particular information can be found. In identifying chassis and model numbers it will be found that the serial numbers on several different chassis may be the same; however, the prefix letter (A-100001, N-100001, etc.), will be different. It is imperative that the prefix letter, as well as the serial number, be noted in order to correctly identify a receiver.

In order to completely identify a particular model, an explanation of the various letters and numerals in the model number designation follows. Prior to 1936 the marking used to designate Zenith Radio models was by arbitrary numerical designations. However, in 1936 a new system of identification was evolved using three separate units to each designation, 1st a number, 2nd a letter and 3rd a number. The first unit, the number, designates the number of tubes. The 2nd unit, the letter, indicates type of service for which the set is intended. The 3rd unit, the number, indicates cabinet type.

The types of service as indicated by the 2nd unit, the letter are as follows:

A --- Straight A-C. All wave.
B --- 6 Volt Battery, Farm.
D --- 110 Volt A-C/D-C.
F --- 2 Volt Farm.
G --- Portable Pack, 110 Volt A-C/D-C.
H --- Straight 110 Volt A-C. Frequency Modulation.
J --- 6 Volt Battery, 110 Volt A-C.
K --- Battery Pack, Farm & Portable.
L --- Long and Standard Wave.
M --- Auto Set (2nd letter designates car for which set is intended).
P --- Straight 110 Volt A-C. Police and Standard Wave.
R --- A-C/D-C (Chassis with 60 cycle Phono) Broadcast only.
S --- Straight 110 Volt A-C. Broadcast and short wave.
T --- Straight 110 Volt A-C.
U --- Straight 110 Volt A-C. Broadcast Ultra short and short wave.
X --- 32 Volt Farm.

A suffix letter or group of letters is used on some models. Usually the suffix letter or letters indicate that the set has some slight variation from the original model bearing no suffix letter, although the sets are basically the same. Suffix letter "T" designates export model. The export models sometime have another suffix letter "A" or "B". The letter "A" indicates 25 cycle all voltage type while letter "B" indicates 50-60 cycle all voltage type. "C" indicates a 50-60 cycle, 95, 117, 150 volt type. Auto sets usually have two letters in the 2nd unit, the second of which designates the make of car for which the set is intended.

To further clarify this system of designations we will give a few examples. First, let us consider Model No. 5-D-610. The 1st number "5" indicates that five tubes are used, the 2nd designation "D" indicates that the model was designed for use on 110-Volt A-C or D-C power lines, the 3rd designation "610" indicates cabinet type, and does not really interest the service-man. Thus Model 5-D-610 is shown to be a 5 tube A-C/D-C set. Let us next consider Model 14-H-697. This can be quickly identified as a 14 tube, straight 110 Volt A-C receiver, with Frequency Modulation band. That is, the 1st number, means 14 tubes, the letter "H" means 110-Volt A-C, F-M, and again the last numerical designation is for cabinet type, and for our purposes can be disregarded. Cabinets are numbered by years, i.e., 300 line was used in 1939, the 400 series in 1940, and the 500 series in 1941 and the 600 series in 1942.

CHASSIS VERSUS MODELS 1936 - 1942 RECEIVERS

Serial Number

CODE A (GREEN SERIAL TAG)

From	To	Chassis	From	To	Chassis
A-100001	A-101400	8A02	A-193801	A-198800	10A1
A-101401	A-102950	12A1	A-198801	A-199800	6A13
A-102951	A-103450	11A1	A-199801	A-202800	6A02
A-103451	A-105450	6A08	A-202801	A-207000	7A02
A-105451	A-106450	6A14	A-207001	A-208000	6A05
A-106451	A-107450	6A02	A-208001	A-215000	8A02
A-107451	A-107950	6A05	A-215001	A-216600	12A1
A-107951	A-108950	6A08	A-216601	A-217100	6A08
A-108951	A-115050	7A02	A-217101	A-217600	6A04
A-115051	A-118550	12A1	A-217601	A-217850	10A3
A-118551	A-120550	6A13	A-217851	A-218850	6A02
A-120551	A-121050	6A14	A-218851	A-220350	7A02
A-121051	A-123050	6A02	A-220351	A-220850	10A3
A-123051	A-126300	7A02	A-220851	A-221850	6A02
A-126301	A-127800	6A08	A-221851	A-224350	7A02
A-127801	A-128800	7A02	A-224351	A-229350	10A1
A-128801	A-130300	6A13	A-229351	A-230350	12A1
A-130301	A-131800	6A14	A-230351	A-230850	7A02
A-131801	A-138300	6A20	A-230851	A-235850	6A05R
A-138301	A-140300	7A02	A-235851	A-238850	7A11
A-140301	A-142300	7A04	A-238851	A-241850	10A2R
A-142301	A-143300	10A3	A-241851	A-243350	10A3R
A-143301	A-144300	8A04	A-243351	A-245350	6A05R
A-144301	A-144550	10A2	A-245351	A-255350	10A1
A-144551	A-146550	7A04	A-255351	A-256550	10A2R
A-146551	A-147050	7A02	A-256551	A-258550	7A11
A-147051	A-148550	12A1	A-258551	A-260550	6A05R
A-148551	A-154550	7A02	A-260551	A-265550	10A1
A-154551	A-155550	6A05	A-265551	A-266750	10A2R
A-155551	A-158550	12A1	A-266751	A-267750	12A6
A-158551	A-163550	6A20	A-267751	A-270250	10A1
A-163551	A-164550	10A3	A-270251	A-271250	10A2R
A-164551	A-164950	6A04	A-271251	A-271850	10A3R
A-164951	A-166300	6A08	A-271851	A-272350	7A11
A-166301	A-169800	6A13	A-272351	A-279350	10A1
A-169801	A-170800	6A14	A-729351	A-282350	10A2R
A-170801	A-171050	10A1	A-282351	A-284350	7A11
A-171951	A-172050	6A05	A-284351	A-294350	7B01
A-172051	A-172300	12A1	A-294351	A-299350	6B02
A-172301	A-174300	6A20	A-299351	A-314350	7B01
A-174301	A-176300	7A04	A-314351	A-333350	6B08
A-176301	A-183800	8A02	A-333351	A-383350	10B1
A-183801	A-184800	6A13	A-383351	A-398350	6B06
A-184801	A-185800	6A14	A-398351	A-423350	8B01
A-185801	A-187300	6A02	A-423351	A-438350	10B2
A-187301	A-188800	7A02	A-438351	A-453350	7B02
A-188801	A-189800	6A08	A-453351	A-454850	12B2
A-189801	A-191800	6A20	A-454851	A-456350	6B06
A-191801	A-192800	8A04	A-456351	A-462350	7B02
A-192801	A-193800	6A05	A-462351	A-467350	12B1

Serial Number

From	To	Chassis
A-467351	A-470350	6B02
A-470351	A-473350	6B06
A-473351	A-478350	12B2
A-478351	A-478850	22B1
A-478851	A-479850	7B01
A-479850	A-482350	6B08
A-482351	A-487350	12B1
A-487351	A-488350	8B01
A-488351	A-488850	12B1
A-488851	A-489850	6B06
A-489851	A-490850	7B02
A-490851	A-490875	9B01
A-490876	A-491625	14B1
A-491626	A-494625	6B08
A-494626	A-504625	7B01R
A-504626	A-511125	7B02
A-511126	A-511625	12B1
A-512126	A-514125	12B2
A-514126	A-514175	6B25
A-514176	A-514275	7B02
A-514276	A-516275	6B08
A-516276	A-520275	7B01R
A-520276	A-530275	7B02
A-530276	A-536275	10B2
A-536276	A-541775	12B2
A-541776	A-544775	6B06
A-544776	A-555775	7B01R
A-555776	A-559775	7B02
A-559776	A-565275	8B01
A-565276	A-575275	10B1
A-575276	A-580275	10B2
A-580276	A-584775	12B1
A-584776	A-586275	12B2
A-586276	A-586475	14B1
A-586476	A-586775	22B1
A-586776	A-587275	12B2
A-586276	A-589275	10B2
A-589276	A-591305	12B2
A-591306	A-592805	12B1
A-592806	A-601805	7B02
A-601806	A-604805	6B06
A-604806	A-607805	10B2
A-607806	A-610305	12B2
A-950001	A-950851	8B04BT
A-950852	A-951351	8B04AT
A-951351	A-951825	5B16BT
A-951826	A-951850	5B16CT
A-951851	A-953350	6B16BT
A-953351	A-954450	5B10BT
A-954451	A-954500	6B23BT
A-954501	A-955950	5B10CT
A-955851	A-956300	6B16BT
A-956301	A-956350	6B23BT
A-956351	A-959050	5B09BT
A-959051	A-961350	5B09CT
A-961351	A-962350	5B10BT
A-962351	A-963350	6B16BT
A-963351	A-963500	8B94BT

Code K

K-1001	K-4000	5401
K-4001	K-4500	5402
K-4501	K-6500	5903
K-6501	K-7500	5903A

Code N

N-24001	N-29750	5621
N-29751	N-34750	5403
N-34751	N-36150	5513
N-36161	N-36250	5513A
N-36251	N-41000	5619
N-41001	N-44150	5704
N-44151	N-44250	5704A
N-44251	N-46350	5903
N-46351	N-56500	5903A
N-46501	N-47800	1202
N-47801	N-48000	1202A
N-48001	N-50000	5405
N-50001	N-50900	5404E
N-50901	N-51000	5404A
N-51001	N-71319	5619
N-84701	N-89200	5403
N-89201	N-92700	5513
N-92701	N-97750	5619
N-97751	N-97750	5405
N-99751	N-100250	1601
N-100251	N-100325	1601A
N-100326	N-100825	1601
N-100826	N-100900	1601A
N-100901	N-105900	5403
N-105901	N-108400	5513
N-108401	N-112900	5619
N-112901	N-114400	5704
N-114401	N-116600	5903
N-116601	N-118600	1202
N-118601	N-121600	5405

Serial Number

From	To	Chassis	From	To	Chassis
N-121601	N-124100	5621	N-296301	N-297800	5516A
N-124101	N-139609	1202	N-297801	N-309800	5634
N-126567	N-143185	5621	N-209801	N-310800	5634A
N-143401	N-146400	5513	N-310801	N-313800	5801
N-146401	N-151400	5619	N-313801	N-314300	5801A
N-151401	N-153900	1202	N-314301	N-319300	1004
N-153901	N-154900	5903	N-319301	N-319800	1004A
N-154901	N-155900	5904A	N-319801	N-322800	1203
N-155901	N-165900	5619	N-322801	N-323050	1203A
N-165901	N-169799	5704	N-323051	N-331550	5406
N-171901	N-176400	5513	N-331551	N-336550	5635
N-176401	N-182900	5619	N-336551	N-345450	5633
N-182901	N-183900	5704	N-345451	N-347025	5707
N-183901	N-184900	5903	N-347026	N-348725	5707E
N-184901	N-185900	1202	N-348726	N-353975	5516
N-185901	N-190900	5405	N-353976	N-355475	5516A
N-190901	N-196900	5621	N-355476	N-359225	5634
N-196901	N-201900	5513	N-359226	N-359825	5634A
N-201901	N-204400	5619	M-359826	N-361625	5801
N-204401	N-205650	5903	N-361626	N-361825	5801A
N-205651	N-208650	5405	N-361826	N-367325	1004
N-208651	N-209650	5514A	N-367326	N-367650	1004A
N-213651	N-215150	5903	N-367651	N-369050	1203
N-215151	N-217150	5405	N-369051	N-369125	1203A
N-217151	N-217650	1202	N-369126	N-374125	5633
N-217651	N-219650	5619	N-374126	N-390125	5516
N-219651	N-221650	5513	N-390126	N-407625	5634
N-221651	N-223150	5621	N-407626	N-410125	5801
N-223151	N-223650	5629	N-410126	N-416375	1004
N-223651	N-223750	Spec.	N-416376	N-418375	1203
N-223751	N-224750	5514A	N-418376	N-428375	5633
N-224751	N-226750	5513	N-428376	N-429375	5707
N-226751	N-228750	5619	N-429376	N-443575	5516
N-228751	N-230750	5405	N-443576	N-444125	5516A
N-230751	N-233750	5621	N-444126	N-461175	5634
N-233751	N-235500	5630	N-461176	N-461875	5634A
N-235501	N-235750	5631	N-461876	N-472125	5801
N-235751	N-236750	5706	N-472126	N-472375	5801A
N-236751	N-237750	5425	N-472376	N-477725	1004
N-237751	N-238750	5513	N-477726	N-477875	1004A
N-238751	N-239750	5619	N-477876	N-480775	1203
N-239751	N-240250	5903	N-480776	N-480875	1203A
N-240251	N-240750	5705A	N-480876	N-483875	5406
N-266201	N-271200	5633	N-483876	N-489375	5635
N-271301	N-276300	5707	N-489376	N-501575	5516
N-276301	N-277800	5632	N-501576	N-501975	5516A
N-277801	N-279800	5630	N-501976	N-510975	5634
N-279801	N-280800	5631	N-510976	N-511275	5634A
N-280801	N-281300	5706	N-511276	N-520275	5801
N-281301	N-296300	5516	N-520276	N-520525	5801A

Serial Number

From	To	Chassis
N-520526	N-528600	1004
N-528601	N-528875	1004A
N-528876	N-531275	1203
N-531276	N-531375	1203A
N-531376	N-538375	5407
N-538376	N-543375	5518
N-543376	N-544875	5636
N-544876	N-546875	5708
N-546876	N-548375	5517A
N-548376	N-548875	5802
N-548876	N-553875	5519
N-553876	N-558875	5407
N-558876	N-561375	5518
N-561376	N-562375	5516AR
N-562376	N-563175	5634A
N-563176	N-567675	5801
N-567676	N-568375	5801A
N-568576	N-568875	5802
N-568876	N-569875	1004
N-569876	N-570575	1004A
N-579576	N-579575	5516R
N-579576	N-582725	5634
N-582626	N-583325	5634A
N-583326	N-587575	5801
N-587576	N-588075	5801A
N-588076	N-590975	1004
N-590976	N-593975	5635
N-593976	N-595975	5518
N-595976	N-598975	5406
N-598976	N-601975	5633
N-601976	N-608975	5516R
N-608976	N-611675	5634
N-611676	N-617675	5801
N-617676	N-621725	1004
N-621726	N-624725	5635
N-621726	N-624725	5407
N-624726	N-624725	5407
N-631726	N-632225	5801A
N-632226	N-642225	5516R
N-642226	N-642725	5516AR
N-647226	N-650405	5634
N-650401	N-650675	5634A
N-650676	N-651875	5707
N-651876	N-752075	5519A
N-652076	N-657275	5801
N-657376	N-657650	5801A
N-657651	N-662450	1004
N-662451	N-662950	1004A
N-662951	N-666450	5635
N-666451	N-667800	5517A

From	To	Chassis
N-667801	N-670800	5518
N-670801	N-677600	5519
N-677601	N-677850	5707E
N-677851	N-679850	5518
N-679851	N-680850	5635
N-680851	N-689350	5516R
N-630351	N-691600	5516AR
N-691601	N-692300	5517
N-692301	N-698300	5634
N-698301	N-699800	5634A
N-699801	N-708100	5801
N-708101	N-709800	5801A
N-709801	N-711000	5802A
N-711001	N-716300	1004
N-716301	N-717100	1004A
N-717101	N-718050	1203
N-718051	N-718250	1203A
N-718251	N-725150	5519
N-725151	N-725250	5519A
N-725251	N-729750	5518
N-729751	N-734250	5635
N-734251	N-738250	5520
N-738251	N-744250	5637
N-744251	N-745250	5803
N-745251	N-747750	5519
N-747751	N-748750	5516R
N-748751	N-750750	5634
N-750751	N-752250	1004
N-752251	N-752750	5634
N-752751	N-754250	5634
N-754251	N-755750	5801
N-755751	N-756800	1004
N-756801	N-756900	1004A
N-756901	N-759400	5406
N-759401	N-760900	5407
N-760901	N-763900	5520
N-763901	N-769900	5637
N-769901	N-770900	5803
N-770901	N-772900	5520
N-772901	N-779900	5637
N-779901	N-780900	5803
N-780901	N-782400	5520
N-782401	N-788400	5637

Code P
(White with Red Ink Serial Tag)

P-1001	P-11000	S-4680
P-24001	P-29000	S-4680
P-100001	P-155250	6A10

Serial Number

From	To	Chassis
R-100001	R-143000	5521
R-143001	R-144000	5521A
R-144001	R-172100	5638
R-172101	R-172400	5638A
R-172401	R-179650	5639
R-179651	R-193750	5709
R-198751	R-194400	5709A
R-194401	R-198400	5710
R-198401	R-232500	5905
R-232501	R-232900	5905A
R-232901	R-251450	1204
R-251451	R-251650	1204A
R-251651	R-265000	5526
R-265001	R-265650	5526A
R-265651	R-271500	1501
R-271501	R-271650	1501A
R-271651	R-279150	5409
R-279151	R-284150	5408
R-284151	R-291150	5522
R-291151	R-296150	5642
R-296151	R-299150	5711
R-299151	R-323900	5644
R-323901	R-324150	5644A
R-324151	R-327650	5524
R-327651	R-335250	5521
R-335451	R-339100	5709
R-339151	R-241150	5408
R-339101	R-339150	5709A
R-339151	R-241150	5408
R-341151	R-344150	5409
R-344151	R-345150	5522
R-345151	R-366150	5644
R-366151	R-366400	5644A
R-366401	R-380650	5638
R-380651	R-380850	5638A
R-380851	R-393250	5905
R-393251	R-393400	5905A
R-393401	R-403800	1204
R-403801	R-403900	1204A
R-403901	R-405775	1501
R-405776	R-405800	1501A
R-405801	R-406800	5642
R-406801	R-408050	5525A
R-408051	R-410550	5640AT
R-410551	R-412250	5804AT
R-412251	R-423425	5521
R-423426	R-425475	5521AT
R-425476	R-433050	5526
B-433051	R-433875	5526AT
B-433876	R-458975	5644
R-458976	R-459975	5644AT
R-459976	R-486675	5638
R-486676	R-486925	5638A
R-486926	R-491390	5709
R-491391	R-493640	5709AT
R-493641	R-518265	5905
R-518226	R-519665	5905AT
R-519666	R-526215	1204
R-526216	R-526265	1204A
R-526266	R-530715	5524
R-530716	R-531715	5524T
R-531716	R-533965	5642
R-533966	R-535965	5711
R-535966	R-536965	5711T
R-536966	R-537815	5710
R-537816	R-544815	5526
R-544816	R-548315	5521
R-548316	R-555215	5638
R-555216	R-555315	5638A
R-555316	R-557265	5644
R-557266	R-557315	5644AT
R-557316	R-573415	5905
R-573416	R-573565	5905AT
R-573566	R-575565	5524
R-576566	R-584965	5644
R-584966	R-585565	5644AT
R-585566	R-595865	5638
R-576566	R-584965	5638
R-595766	R-597165	5638A
R-597166	R-598565	5711
R-598566	R-599565	5711T
R-599566	R-601565	5642
R-601566	R-602065	5640AT
R-602066	R-602565	5804AT
R-602566	R-605565	5521
R-605566	R-606965	5709
R-606966	R-610965	5524
R-610966	R-613465	5642
R-613466	R-614465	5711
R-614466	R-614715	5639
R-614716	R-614965	5710
R-614966	R-619965	5526
R-619966	R-620465	5526AT
R-620466	R-626065	5521
R-626066	R-626665	5521AT
R-626666	R-629665	5644
R-629666	R-633815	5638
R-633816	R-634140	5905
R-634141	R-635140	5905AT
R-635141	R-635370	1204

Serial Number

From	To	Chassis
R-635371	R-637470	5640AT
R-637471	R-638670	5804AT
R-638671	R-639670	5524
R-639671	R-640670	5711T
R-640671	R-640920	5709AT
R-640921	R-641220	5639
R-641221	R-641520	5710
R-641521	R-642520	5527
R-642521	R-643770	5645
R-643771	R-643920	5638
R-643921	R-643945	5905
R-643946	R-643971	5521
R-643972		5523
R-643973	R-643984	5524
R-643985		5525A
R-643986		5526A
R-643987	R-643996	5642
R-643997	R-644000	1204A
R-644001	R-645000	5527
R-650001	R-652000	5530
R-652001	R-653000	5650
R-653001	R-654500	5527
R-654501	R-656500	5530
R-656501	R-657750	5645
R-657751	R-659750	5527
R-659751	R-661250	5645
R-661251	R-671050	5907
R-671051	R-673050	5530
R-673051	R-678050	5714
R-678051	R-679650	1206
R-679651	R-680450	1502
R-680451	R-689950	5907
R-689951	R-690950	1206
R-690951	R-691450	1502
R-691451	R-695500	5907
R-695501	R-699925	1206
R-699926	R-729900	5646
R-729901	R-733850	5651
R-733851	R-750350	5646
R-750351	R-751350	5647
R-751351	R-768350	5528
R-768351	R-794350	5646
R-794351	R-802350	5647
R-802351	R-816950	5528
R-816951	R-838500	5714
R-838501	R-843550	5651
R-843551	R-849050	5529
R-849051	R-851050	5528
R-851051	R-853550	5410
R-853551	R-854550	5410S
R-854051	R-857051	5653
R-857051	R-859050	5653
R-859051	R-860300	5654
R-860301	R-862300	5715
R-862301	R-872300	5646
R-872301	R-880100	5647
R-880101	R-889600	5528
R-889601	R-899600	5529
R-899601	R-901200	5647
R-901201	R-905100	5528
R-905101	R-91125	5529
R-911926	R-915825	5651
R-915826	R-926725	5714
R-926726	R-928225	5410
R-928226	R-929225	5411
R-929226	R-931225	5654
R-931226	R-932725	5410
R-932726	R-933225	5410S
R-933226	R-934225	5653
R-934226	R-936625	5529
R-936626	R-937725	5714
R-937726	R-940225	5907
R-940226	R-946925	5646
R-946926	R-949425	5647
R-949426	R-951225	5651
R-951226	R-957700	5714
R-957701	R-959200	1206
R-959201	R-960200	1502
R-960201	R-962200	5646
R-962201	R-963200	5651
R-963201	R-965000	5528
R-965001	R-965700	5907A
R-965701	R-965800	5528A
R-965801	R-965850	5529A
R-965851	R-966350	5714A
R-966351	R-966550	1206A
R-966551	R-966750	1502A
R-966751	R-967500	5651A
R-967501	R-968500	5528A
R-968901	R-969550	5714A
R-969551	R-970100	5651A
R-970101	R-971200	5529A
R-971201	R-971500	5907A
R-971701	R-971725	5714A
R-971726	R-972300	5715
R-972301	R-972900	5653
R-973001	R-973750	5528A
R-973751	R-974200	5529A
R-974201	R-974400	5714A
R-974401	R-974825	5907A
R-974826	R-975425	5529A

Serial Number

From	To	Chassis
R-975426	R-975525	5051A
R-975526	R-976125	5529A
R-976126	R-976325	5714A
R-976326	R-976725	5907A
R-976726	R-976925	5651B
R-977126	R-977325	5907B
R-976926	R-977125	5714B
R-977326	R-977625	5528B
R-977626	R-978425	5529B
R-978426	R-978625	5714B
R-978626	R-978850	5907B
R-979101	R-979225	5529B
R-979226	R-979600	5529A
R-979601	R-979700	5651
R-979701	R-980100	5651B
R-980101	R-980600	5908T
R-980601	R-981050	5532BT
R-901051	R-981100	5532AT
R-981101	R-981150	5807A
R-982951	R-984950	5535B
R-985011	R-985610	5907BT
R-985611	R-990610	5657U
R-990611	R-992610	5535B
R-992611	R-992719	5807A
R-992711	R-992910	5908T
R-992911	R-994410	5535B
R-994411	R-995610	5669BT
R-995611	R-996410	5669AT
R-996411	R-996960	5720AT
R-996901	R-998110	5720BT
R-998111	R-998610	5723AT

Code S
(Green Serial Tag)

From	To	Chassis
S-100001	S-103400	5528
S-103401	S-109450	5529
S-109451	S-113150	5907
S-113151	S-115150	5411
S-115151	S-126650	5714
S-126651	S-132450	5646
S-132451	S-134050	5528
S-135551	S-138050	5907
S-138051	S-143300	5646
S-143301	S-146300	5647
S-146301	A-150300	5528
S-150301	S-156050	5714
S-156051	S-156550	5410
S-156551	S-157050	5410 S
S-157051	S-158050	5654
S-158051	S-161050	5646
S-161051	S-162550	5647
S-162551	S-165400	5528
S-165401	S-168425	5529
S-168426	S-169625	5651
S-169626	S-170625	5412
S-170626	S-174625	5646
S-174626	S-176175	5528
S-176176	S-178325	5529
S-178326	S-183825	5714
S-183826	S-186225	5907
S-186226	S-197225	5646
S-197226	S-200725	5647
S-200726	S-202725	5528
S-202726	S-212725	5714
S-212726	S-216725	5907
S-216726	S-218725	5529
S-218726	S-237225	5646
S-237226	S-239225	9647
S-239226	S-243725	5520
S-243726	S-244975	5651
S-244976	S-251075	5714
S-251076	S-252175	5907
S-252176	S-252675	1206

Serial Number

From	To	Chassis
S-252676	S-255175	5412
S-255176	S-275275	5647
S-257276	S-261475	5528
S-261476	S-264275	5529
S-264276	S-269775	5714
S-269776	S-272775	5907
S-272776	S-275775	5415
S-275776	S-276275	5412S
S-276276	S-281275	5657
S-281276	S-285775	5646
S-285776	S-288775	5528
S-288776	S-292775	5714
S-292776	S-293775	5907
S-293776	S-295725	5807
S-295726	S-296725	5415
S-296726	S-298725	5412
S-298726	S-298925	5412S
S-298926	S-319325	5646
S-319326	S-320925	5647
S-320926	S-320225	5528
S-320226	S-322285	5651
S-329486	S-339485	5657
S-339486	S-343485	5807
S-343486	S-346985	5646
S-346986	S-349485	5657
S-349486	S-352985	5528
S-352986	S-355985	5529
S-355986	S-359485	5714
S-359486	S-360485	5907
S-360486	S-362985	5412
S-362986	S-363235	5412S
S-363236	S-365735	5415
S-365736	S-368735	5807
S-368736	S-369035	5412
S-369036	S-369135	5412S
S-369136	S-369735	5415
S-373786	S-376735	5646
S-376786	S-381735	5657
S-381736	S-382735	5647
S-382736	S-384235	5528
S-384235	S-385235	5714
S-385236	S-386235	5907
S-386236	S-389235	5807
S-389236	S-390235	5415
S-390236	S-399235	5646
S-399236	S-402735	5657
S-402736	S-404235	5529
S-404236	S-406235	5714
S-406236	S-407635	5807
S-407636	S-408635	5907
S-408636	S-409635	5412
S-409636	S-409885	5412S
S-409886	S-411885	5415
S-411886	S-412885	5647
S-412886	S-413885	5528
S-413886	S-414385	5529
S-414386	S-417885	5657
S-417886	S-418885	5412
S-418886	S-421385	5416
S-421386	S-423885	5657
S-423886	S-424985	5646
S-424986	S-425485	5415
S-425486	S-425715	1204
S-425716	S-428215	5657
S-428216	S-429465	5714
S-430466	S-431965	5415
S-431966	S-439465	5416
S-439466	S-440065	5907
S-440066	S-463065	5719
S-463066	S-470840	5721
S-470841	S-474065	5725
S-474066	S-477765	5719
S-477766	S-488065	5724
S-477766	S-513065	5808
S-513066	S-528065	1005
S-528066	S-546265	1207
S-546266	S-561265	5678
S-561266	S-562015	1503
S-562016	S-573015	5724
S-573016	S-576315	5725
S-576316	S-588315	5808
S-588316	S-605315	1005
S-605316	S-620315	1103
S-620316	S-640315	5808
S-640316	S-655315	1005
S-655316	S-670315	5678
S-670316	S-672290	5725
S-672291	S-680290	1103
S-680291	S-690290	5678
S-690291	S-714290	1005
S-714291	S-740190	5808
S-740191	S-750190	1005
S-750191	S-762463	5810
S-762464	S-765380	5811
S-765381	S-770380	5678
S-770381	S-780380	1005
S-780381	S-781230	5808
S-781231	S-786230	7A01
S-786231	S-788230	8A01
S-788231	S-804230	6A02

Serial Number

From	To	Chassis
S-804231	S-805230	8A01
S-805231	S-808230	6A04
S-808231	S-829730	7A02
S-829731	S-836730	8A02
S-836731	S-843230	10A1
S-843231	S-849230	6A05
S-840231	S-859230	7A04
S-859231	S-862230	8A03
S-862231	S-865230	10A2
S-865231	S-870180	12A3
S-870181	S-870730	12A4
S-871000	S-871730	6A08
S-871731	S-873730	8A03
S-873731	S-874730	10A4
S-874731	S-877730	6A02
S-877731	S-881730	6A14
S-881731	S-883730	6A16
S-883731	S-884730	6A08
S-884731	S-889730	8A02
S-889731	S-890730	8A03
S-890731	S-893230	7A04
S-893231	S-893730	7A02
S-893731	S-894000	6A08
S-894001	S-903000	6A02
S-903001	S-904000	6A13
S-904001	S-906500	6A05
S-906501	S-910500	6A12
S-910501	S-911500	6A02
S-911501	S-916500	6A14
S-916501	S-924900	7A02
S-924901	S-925400	7A04
S-925401	S-926400	10A2
S-926401	S-950000	8A02
S-950001	S-951500	5535BT
S-951501	S-952450	5910BT
S-952451	S-953000	5910AT
S-953001	S-954000	5535ZBT
S-954001	S-954750	1102AT
S-954751	S-955750	5669BT
S-955751	S-956750	5535ZBT
S-956751	S-957750	5720BT
S-957751	S-958750	5910BT
S-958751	S-960750	5535ZBT
S-960751	S-961250	5669BT
S-961251	S-961500	5669AT
S-961501	S-961800	5669BT
S-961801	S-962800	5535ZBT
S-962801	S-963800	5535BT
S-963801	S-964800	5535ZBT
S-964801	S-965300	5535ABT
S-965301	S-967300	5A04BT
S-967301	S-967550	5A06BT
S-967551	S-967800	5A06AT
S-967801	S-969800	6A11BT
S-969801	S-970100	6A11AT
S-970101	S-980300	8A05AT
S-970301	S-971100	8A05BT
S-971101	S-971850	5A06BT
S-971851	S-972100	5A08BT
S-972101	S-973300	5A04BT
S-973301	S-973550	5A06AT
S-973551	S-974150	5A06BT
S-974151	S-975450	6A11BT
S-975451	S-976250	8A05BT
S-976251	S-976750	5A04BT
S-976751	S-977300	6A11BT
S-977301	S-977400	6A11AT
S-977401	S-977650	8A05BT
S-977651	S-977750	8A05AT
S-977751	S-987500	5A04BT
S-978501	S-979500	6A11BT
S-979501	S-979850	6A11AT
S-979851	S-980100	5A08BT
S-989101	S-980350	6A11AT
S-980351	S-980600	6A11BT
S-980601	S-980850	8A05AT
S-980851	S-981350	5B08AT
S-981351	S-983850	5B08BT
S-983851	S-984050	5B08CT
S-984051	S-984550	8A05BT
S-984551	S-986550	5B09BT
S-986551	S-986750	5B09CT
S-986751	S-987050	5B10AT
S-987051	S-988550	5B10BT
S-988551	S-988650	5B10CT
S-988651	S-989150	6B16AT
S-989150	S-991850	6B16BT
S-991851	S-992150	6B16CT
S-992151	S-994150	5B09BT
S-994151	S-994650	6B16BT
S-994651	S-994850	5B09CT
S-994851	S-995050	5B10AT
S-995051	S-995650	5B10BT
S-995651	S-995850	5B10CT
S-995851	S-997800	6B16BT
S-997801	S-998350	6B16AT
S-998351	S-999999	8B04BT

CODE T (PALE BLUE SERIAL TAG)

Serial Number

From	To	Chassis
T-100001	T-115000	5537
T-115001	T-115350	5718T
T-115351	T-116350	5538
T-116351	T-123850	5419
T-123851	T-126850	5539
T-126851	T-130850	5537
T-130851	T-133350	5539
T-133351	T-143350	5537
T-143351	T-146850	5536
T-146851	T-151850	5537
T-151851	T-162850	5420
T-162851	T-165350	5417
T-165351	T-175350	5537
T-175351	T-176350	5541T
T-176351	T-176850	5417
T-176851	T-178350	5679
T-178351	T-178850	5417
T-178851	T-181850	5420
T-181851	T-188850	5420S
T-188851	T-189850	5722
T-189851	T-191850	5420
T-191851	T-194850	5420S
T-194851	T-195850	5417
T-195851	T-197050	5417S
T-197051	T-297050	5537
T-207051	T-208050	5722T
T-208051	T-214050	5537
T-214051	T-215550	5420
T-215551	T-217550	5420S
T-217551	T-218300	5541T
T-218301	T-219800	5420
T-219801	T-22300	5420S
T-222301	T-232300	5A01
T-232301	T-233300	44A01
T-233301	T-234300	4A03
T-234301	T-239300	4A02
T-239301	T-246300	4A04
T-246301	T-246300	5A01
T-256301	T-260300	5A02
T-260301	T-290300	5A01
T-290301	T-291300	4A02
T-291301	T-294300	4A04
T-294301	T-299300	5A01
T-299301	T-300700	5A05T
T-300701	T-301050	5A07T
T-301051	T-316050	5A01
T-316051	T-316550	5722
T-316551	T-331550	6A19
T-331551	T-336550	5A03
T-336551	T-346550	6A19
T-346551	T-351550	5A10
T-351551	T-354300	6A19
T-354301	T-355800	6A18
T-355801	T-360800	5A03
T-360801	T-370800	6A19
T-370801	T-371800	5A07T
T-371801	T-377150	5A03
T-377151	T-384250	6A19
T-384251	T-386250	5A10
T-386251	T-398250	6A19
T-398251	T-400250	5A10
T-400251	T-405250	5A03
T-405251	T-421000	5A10
T-421001	T-431000	4B01
T-431001	T-434000	5A10
T-434001	T-444000	6A19
T-444001	T-444500	5407T
T-444501	T-445300	6A18T
T-445301	T-446300	5A10
T-446301	T-448800	6A25
T-448801	T-453300	5A10
T-453301	T-454350	7A10T
T-454351	T-475450	6A19
T-475451	T-494350	6B07
T-494351	T-504350	4B01
T-504351	T-510350	5A10
T-510351	T-520350	6A19
T-520351	T-522750	5A10
T-522751	T-527750	5B03
T-527751	T-530250	6B03
T-530251	T-532550	5A10
T-532551	T-532800	5A05T
T-532801	T-533050	5A07T
T-533051	T-533300	6A18T
T-533301	T-562400	6B03
T-562401	T-567400	4B02
T-567401	T-573400	4B03
T-573401	T-579400	5B05
T-579401	T-580400	4B04
T-580401	T-582900	6B09
T-582901	T-585900	5B06
T-585901	T-588400	5B04
T-588401	T-590900	4B05
T-590901	T-605900	5B07
T-605901	T-606200	5A05T
T-606201	T-606450	5A07T
T-606451	T-606610	6A18T
T-606611	T-606860	6B03
T-606861	T-681360	6B03
T-681361	T-686360	4B01
T-686361	T-687360	5B11T
T-687361	T-688360	5B12T

Serial Number

From	To	Chassis
T-688361	T-689860	6B17T
T-639861	T-690860	5B11T
T-690861	T-691860	5B12T
T-691861	T-693060	6B17T
T-693861	T-694710	7B06T
T-694711	T-704710	4B02
T-704711	T-712710	4B03
T-712711	T-713710	5B04
T-713711	T-714710	5B05
T-714711	T-715710	5B06
T-715711	T-778710	6B03
T-778711	T-785710	4B03
T-785711	T-788710	4B02
T-788711	T-791210	4B03
T-791211	T-792719	5B05
T-792711	T-794210	5B06
T-794211	T-844210	6B03
T-844211	T-846010	6B09
T-846011	T-847010	5B12T
T-847011	T-857010	7B04
T-858011	T-859010	7B06T
T-859011	T-860260	5B12T
T-860261	T-880260	7B04
T-880261	T-885260	6B03
T-885261	T-890260	7B04

Code U
(White Serial Tag)

From	To	Chassis
U-100001	U-100500	5809T
U-100501	U-101500	5680T
U-101501	U-102000	1006T
U-102001	U-103000	5680T
U-103001	U-103500	5809T
U-103501	U-152500	6A01
U-152501	U-153400	6A06T
U-153401	U-153750	6A12T
U-153751	U-181750	6A01
U-181751	U-199750	6A16
U-199751	U-200750	7A05T
U-200751	U-210750	6A01
U-210751	U-211750	6A12T
U-211751	U-214760	6A01
U-214751	U-217750	6A16
U-217751	U-229750	6A01
U-229751	U-232750	6A16
U-232751	U-239750	6A01
U-239751	U-248250	6A16
U-248251	U-261250	6A01
U-261251	U-264250	6A16
U-264251	U-278750	6A01
U-278751	U-282250	6A16
U-282251	U-301250	6A01
U-301251	U-306250	6A24
U-306251	U-329250	6A26
U-329251	U-378250	5B01
U-378251	U-393250	6A26
U-393251	U-405250	5B01
U-405251	U-455250	5B02
U-455251	U-473250	6B01
U-473251	U-508250	6B04
U-508251	U-528501	6B05
U-528251	U-533250	5B01
U-533251	U-537250	6A26
U-537251	U-530250	6A24
U-539251	U-544250	5B02
U-544251	U-549250	6B04
U-549251	U-550450	6A24
U-550451	U-555450	5B13
U-555451	U-560450	6B01
U-560451	U-460950	6B12T
U-560951	U-561450	6B13T
U-561451	U-581450	5B02
U-581451	U-591450	6B04
U-591451	U-621450	6B01
U-621451	U-636450	6B05
U-636451	U-646450	5B14
U-646451	U-647450	7B05T
U-647451	U-655950	6B14
U-655951	U-656450	6B12T
U-656451	U-656950	6B13T
U-656951	U-658950	5B13
U-658951	U-663950	5B14
U-663951	U-666950	6B01
U-666951	U-669950	6B04
U-669951	U-672950	6B05
U-672951	U-675950	6B14
U-675951	U-676450	6B05T
U-676451	U-636450	5B02
U-686451	U-689450	5B14
U-689451	U-691950	5B13
U-691951	U-706950	6B01
U-606951	U-716950	6B05
U-716951	U-721950	6B14
U-721951	U-722450	6B12T
U-722451	U-722950	6B13T
U-722951	U-723200	7B05T
U-723201	U-723450	6B13T
U-723451	U-738450	5B02

Serial Number

From	To	Chassis
U-738451	U-743450	6B01
U-743451	U-748450	6B05
U-748451	U-753450	6B14
U-753451	U-758450	5B14

Code V
(Orange Serial Tag)

V-100001	V-125000	5659
V-125001	V-137000	5660
V-137001	V-151000	5661
V-151001	V-162000	5662
V-162001	V-164000	5659
V-164001	V-210000	5660
V-210001	V-216000	5652
V-216001	V-226000	5659U
V-226001	V-275000	5659
V-275001	V-282500	5419
V-282501	V-284000	5419
V-286501	V-317500	5659
V-317501	V-319500	5675
V-319501	V-336500	5660
V-336501	V-344000	5662
V-350001	V-360000	5659
V-360001	V-364906	5672P
V-364907	V-368811	5675
V-368812	V-371111	5419
V-371112	V-372611	5670
V-372612	V-373611	5674
V-373612	V-378511	5659U
V-378512	V-380937	5661
V-388938	V-418937	5660
V-418938	V-479839	5659
V-479840	V-491339	5662
V-491340	V-493839	5659U

From	To	Chassis
	Record Players	
1	3000	S-6622
3001	3500	S-6622R
3501	4500	S-7000
4501	5500	S-7001
5501	6500	S-7002
6501	7500	S-7003
7501	9500	S-8500
9501	10500	S-8501
10501	13500	S-8500Z
13501	15500	S-8501Z
16001	17000	S-8501Z
15501	16000	S-9000
17001	18000	S-9000
18001	20000	S-9002
20001	25000	S-9001
	Auto Sets	
H-1001	H-21600	6MH699
W-100001	W-102500	6MW693
Z-100001	Z-155200	6MN390
Z-160001	Z-258000	6MF490
Z-500001	Z-501500	6MN495
Z-506501	Z-510000	6MN495
Z-510001	Z-514000	6MN496
Z-514001	Z-523016	6MN495
Z-525001	Z-527500	7MN596
Z-527501	Z-530000	6MN595
Z-530001	Z-537111	7MN596
Z-550001	Z-536000	6MN595
Z-260001	Z-385000	6MF590
Z-285001	Z-295000	6MF591
Z-295001	Z-397500	6MF590
Z-400001	Z-410400	7ML592
Z-410401	Z-410500	7ML592E
Z-410501	Z-416900	7ML592
Z-450001	Z-470000	6MF593
Z-570001	Z-585000	6MN695
Z-600001	Z-642000	6MF690
Z-750001	Z-756000	8ML692

CHASSIS VERSUS MODELS 1936 - 1942 RECEIVERS

Chassis	Used in Models	Diagram on Page & Vol.
1004	10S-130	342-1
	10S-147	
	10S-153	
	10S-155	
	10S-156	
	10S-157	
	10S-160	
1005	10S-443	600-1
	10S-452	
	10S-464	
	10S-470	
	10S-491	
	10S-492	
1103	11S-474	602-1
1202	12A-57	263-1
	12A-58	
1203	12U-158	346-1
	12U-159	
1204	12S-205	428-1
	12S-232	
	12S-245	
	12S-265	
	12S-266	
	12S-267	
	12S-268	
	12S-374	
1206	12S-345	492-1
	12S-370	
	12S-371	
1207	12S-445	604-1
	12S-453	
	12S-471	
	12S-475	
	12S-494	
1501	15U-246	430-1
	15U-269	
	15U-270	
	15U-271	
	15U-272	
	15U-273	
1502	15S-308	494-1
	15S-346	
	15S-372	
	15S-373	
1503	15S-479	606-1
	15S-495	
1601-C	16A-61	279-1
1601-P	16A-63	279-1
5401	4P-26	235-1
	4P-51	
5403	4T-26	239-1
	4T-51	
5405	4V-31	271-1
	4V-59	
5406	4B-106	328-1
	4B-131	
	4B-132	
	4B-127	
5407	4F-133	359-1
5408	4F-227	400-1
5409	4B-231	402-1
5410	4B-313	462-1
5411	4B-314	464-1
	4B-317	
5412	4K-310	515-1
	4K-355	
5413	4K-329	517-1
5414	4K-332	515-1
	4K-354	
5416	4K-400	526-1
5417	4B-422	580-1
	4B-437	
	4B-466	
	4B-468	
5419	4K-402	530-1
5420	4K-422	582-1
	4K-435	
	4K-465	

Chassis	Used in Models	Diagram on Page & Vol.
5510	5M-90	312-1
5513	5S-29 5S-56	247-1
5516	5S-119 5S-126 5S-127 5S-150 5S-151 5S-161	352-1
5518	5F-134 5F-166	363-1
5519	5R-123 5R-135 5R-165	375-1
5520	5M-191	378-&-393-1
5521	5S-201 5S-218 5S-220 5S-228 5S-237 5S-250 5S-252	404-1
5522	5F-233 5F-251 5F-230	410-1
5523	5X-230 5X-248 5X-274	437-1
5524	5J-217 5J-247 5J-255	408-1
5526	5R-216 5R-226 5R-236	406-1
5527	5M-291	446-1
5528	5R-303 5R-312 5R-316 5R-317 5R-337	466-1
5529	5S-319 5S-327 5S-330 5S-338 5S-339	468-1
5530	5M-294	448-1
5536	5G-438 5G-467	584-1
5537	5G-401 5G-403 5G-405 5G-442 5G-461	532-1
5538	5G-484	536-1
5539	5G-441 5G-442 5G-461	532-1
5619	6S-27 6S-52	251-1
5621	6V-27 6V-62	275-1
5630	6M-90-S 6M-90-D	316-1
5631	6M-91-S 6M-91-D	318-1
5632	6M-92	314-1
5633	6D-116 6D-117 6D-118	334-1
5634	6S-128 6S-137 6S-147 6S-152 6S-157	338-1
5635	6B-107 6B-129 6B-164	330-1
5637	6M-192 6M-193 6M-194	381-1 & 394-1 384-1 & 395-1 395-1
5638	6S-203 6S-222 6S-223 6S-229 6S-239 6S-241	414-1

Chassis	Used in Models	Diagram on Page & Vol.
5639	6D-202	412-1
	6D-219	
	6D-221	
	6D-238	
5642	6J-230	416-1
	6J-257	
5644	6S-254	418-1
	6S-256	
5645	6M-292	450-1
	6M-293	
5646	6D-302	470-1
	6D-311	
	6D-326	
	6D-336	
	6D-360	
5647	6D-312	472-1
	6D-316	
	6D-317	
	6D-337	
5648	6S-330	476-1
	6S-361	
5649	6S-341	478-1
	6S-350	
	6S-351	
	6S-352	
	6S-362	
5650	6M-295	452-1
5651	6S-301	474-1
	6S-304	
	6S-305	
	6S-306	
	6S-321	
	6S-322	
	6S-340	
5653	6B-318	480-1
	6B-356	
5654	6J-322	482-1
	6J-357	
5659	6D-419	538-1
	6D-411	
5659U	6D-425	
	6D-4100	
	6D-4111	
	6D-4225	
5660	6D-413	540-1
	6D-414	
5660	6D-426	540-1
	6D-427	
	6D-446	
	6D-455	
	6D-456	
5661	6P-416	542-1
	6P-417	
	6P-428	
5662	6P-418	544-1
	6P-419	
	6P-429	
	6P-430	
	6P-447	
	6P-448	
	6P-457	
5663-UP	6R-480	
5670	6R-1470	
5672	6R-485	586-1
5673	6MN-495	
5675	6R-481	588-1
5676	6MN-496	
5678	6S-439	590-1
	6S-469	
5679	6J-436	
	6J-463	
5704	7S-28	255-1
	7S-53	
	7S-54	
5706	7M-91S	320-1
	7M-91D	
5707	7D-119	336-1
	7D-126	
	7D-127	
	7D-138	
	7D-148	
	7D-151	
	7D-162	
	7D-168	
5709	7S-204	422-1
	7S-232	
	7S-240	
	7S-242	
	7S-258	
	7S-260	
	7S-261	

Chassis	Used in Models	Diagram on Page & Vol.
5710	7D-203	420-1
	7D-222	
	7D-223	
	7D-229	
	7D-239	
	7D-241	
	7D-243	
	7D-253	
	7D-255	
5711	7J-232	424-1
	7J-259	
	7J-260	
5713	7D-321	
	7D-301	
	7D-368	
	7D-305	
	Amended (2/22/45)	
5714	7S-323	486-1
	7S-342	
	7S-343	
	7S-363	
	7S-364	
5715	7J-323	
	7J-358	
	7J-368	
5719	7S-432	546-1
	7S-433	
5724	7S-432	594-1
	7S-434	
	7S-449	
	7S-450	
	7S-458	
	7S-459	
	7S-460	
	7S-461	
	7S-462	
5725	7S-487	
	7S-488	
	7S-490	
5801	8S-129	340-1
	8S-154	
	8S-128	
	8S-147	
	8S-157	
5803	8M-195	386 & 396-1
5807	8S-359	521-1
5808	8S-443	598-1

Chassis	Used in Models	Diagram on Page & Vol.
5808	8S-451	598-1
	8S-451	
	8S-463	
5810	8S-432	616-1
	8S-433	
	8S-434	
	8S-449	
	8S-450	
	8S-458	
	8S-459	
	8S-460	
	8S-461	
	8S-462	
5811	8S-487	
Revised	8S-488	
5721	8S-490	
5903	9S-30	259-1
	9S-54	
	9S-55	
5905	9S-204	426-1
	9S-232	
	9S-242	
	9S-244	
	9S-262	
	9S-263	
	9S-264	
5906	9S-365	488-1
5907	9S-307	490-1
	9S-324	
	9S-344	
	9S-367	
	9S-369	
4A01	4B-515	4-2-H7
4A02	4K-515	6-2-H7
4A03	4B-536	
4A04	4K-535	6-2-H7
	4K-570	
4B01	4K-600	129-2-H9
4B02	4K-616	165-2-H10
	4K-2616	
4B03	4K-635	
	4K-658	
4B04	4B-639	167-2-H10

Chassis	Used in Models	Diagram on Page & Vol.
4B05	4K-640	169-2-H10
5A01	5G-500	8-2-H7
5A02	5G-537 5G-572	10-2-H10
5A03	5G-504	69-2-H8
5A10	5G-510 5G-534	
5B01	5D-610 5D-625	131-2-H9
5B02	5D-611 5D-627 5D-2611	171-2-H10
5B03	5R-680	173-2-H10
5B04	5K-637	175-2-H10
5B05	5G-617 5G-2617	177-2-H10
5B06	5G-636	
5B07	5G-636	
5B07	5G-603	179-2-H10
5B13	5R-686	
6A01	6D-510 6S-518	10-2-H7
6A02	6S-527	14-2-H7
6A04	6S-580	14-& 31-2-H7
6A05	6S-546 6S-556	16-2-H7
6A05R	6S-532	139-2-H9
6A08	6R-583	13 & 30-2-H7
6A10	6D-525 6D-526	12-2-H7
6A13	6S-511	14-a-H7
6A14	6S-511W	14-2-H7
6A16	6D-512 6D-539	73-2-H8
6A17	6MF-595	41-2
6A19	6G-505	75-2-H8
6A20	6S-596 6S-597	77-2-H8
6A21	6MF-591	
6A24	6D-516	133-2-H9
6A23	6MF-593	
6A25	6G-533 6G-560	137-2-H9
6A26	6D-520 6D-538	135-2-H9
6B01	6D-614 6D-2614 6D-629	185-2-H10
6B02	6R-631	187-2-H10
6B03	6G-601	189-2-H10
6B04	6D-612 6D-2612 6D-622 6D-628	191-2-H10
6B05	6D-615 6D-2615 6D-630	193-2-H10
6B06	6R-683 6R-684 6R-687 6R-688	175-2-H10
6B08	6S-632 6S-646 6S-656	197-2-H10
6B09	6G-638 6G-660	199-2-H10
6B11	6MH-699	292-2
6B14	6D-620 6D-2620 6D-644	309-2-H11
6B19	6MF-690	261-2
6B21	6MF-693	269-2

Chassis	Used in Models	Diagram on Page & Vol.
6B25	S-9005	319-2-H11
7A01	7S-585	18-2-H7
7A02	7S-529 7S-530 7S-547 7S-557 7S-558 7S-559	20-2-H7
7A04	7S-581 7S-582 7S-584 7S-591 7S-591J	20 & 31-2-H7
7A08	6MN-596	41-2
7A09	7ML-592	57-2
7A11	7S-598	141-2-H9
7B01	7S-633 7S-634 7S-657	201-2-H10
7B01R	7S-633R 7S-634R 7S-657R	201-2-H10
7B02	7S-681 7S-682 7S-685	203-2-H10
8A01	8S-586	22-2-H7
8A02	8S-531 8S-548 8S-563 8S-563S	24-2-H7
8A03	8S-587 8S-588	24 & 31-2-H7
8A04	8S-593 8S-594	79-2-H8
8B01	8S-647 8S-661	205-2-H10
10A1	10S-531 10S-549 10S-566 10S-567	26-2-H7
10A2	10S-589 10S-590	26 & 32-2-H7
10A2R	10S-599	144-2-H9
10A3	10H-551 10H-571	81-2-H8
10A3R	10H-571R 10H-573	143-2-H9
10B1	10S-668 10S-669	207-2-H10
10B2	10S-690	207-2-H10
12A1	12S-550Z 12S-568E 12S-568Z 12S-569Z	83-2-H7
12A2	12S-595Z	85-2-H8
12A3	12S-550 12S-568 12S-569	28-2-H7
12A4	12S-595	28 & 32-2-H7
12A6	12H-678 12H-679	209-2-H10
12B1	12H-650 12H-670	211-2-H10
12B2	12H-689 12H-691 12H-695 12H-696	213-2-H10
14B1	14H-697	313-2-H11
22B1	22H-698 22H-699	315 & 317-2-H11

COMBINED INDEX VOLUMES 1, 2 AND 3

MODEL	YEAR	CHASSIS	VOLUME	PAGE
A	1931		1	21
B	1931		1	21
C	1931		1	21
C-10		2009-C	1	23
D	1931		1	21
L	1931	2009-C	1	23
LP	1931	2009-CP	1	25
AH	1931	2012J	1	27
CH	1931	2012J	1	27
BH	1931	2012J	1	27
RH	1931	2021	1	59
LH	1932	2022	1	61
LS	1931	2004	1	21
MH	1932	2022	1	61
TH	1931	2012	1	27
V-8	1931	2012-4J	1	27
WH	1932	2022	1	61
WHA	1932	2022	1	61
7 Jr*	1934		1	207
7	1932	2037B	1	97
10	1930		1	13
11	1930		1	13
12	1930		1	13
50	1928		1	1
52	1928		1	1
54	1928		1	1
60	1929		1	1
60-2	1929		1	1
61	1929		1	1
62	1929		1	1
64	1929		1	1
67	1929		1	1
70	1930		1	9
71	1930		1	9
72	1930		1	9
73	1930		1	9
77	1930		1	9
80	1931		1	17
90	1930	2012-4J	1	27
90-0	1930	2012-4J	1	27
91	1931	2014	1	31
92	1931	2014	1	31
102	1930		1	13
103	1931	2017	1	47
112	1930		1	13
122	1930		1	13
207	1933	Same as 702	1	131
208	1933	Revised 207	1	131
210	1932	2022	1	61 & 63
211	1932	2022	1	63
211	1932	2022 A & B	1	63
215	1932	2044	1	67
215-3	1932	2044	1	67
216	1932	2044	1	67
217	1932	2044	1	67
220	1932	2022	1	63
220-3	1932	2022 A & B	1	63
221	1932	2022	1	63
225	1932	2044	1	67
230	1933	2036	1	71
238	1932	2053B	1	121
240	1933	2036	1	71
241	1933	2036	1	71
244	1933	2036	1	71
245	1933	2036	1	71
245-A	1933	2036	1	71
250	1933	2031	1	75
250-3	1933	2031	1	75
251	1933	2031	1	75
252	1933	2031	1	75
258	1933	2051	1	113
259	1933	2031	1	75
260	1933	2031	1	75
261	1933	2031	1	75
262	1933	2031	1	75
263	1932	2044	1	67
268	1933	2051	1	113
268-A	1933	2051	1	113
269	1933	2031	1	75
270	1932	2022	1	63
270	1932	2022 A & B	1	63
271	1933	2036	1	71
271-1	1932	2037	1	97
271-21	1932	2037	1	97
271-31	1932	2037	1	97
272	1933	2031	1	75
273	1933	2030	1	85
277	1933	2056	1	109
278	1933	2051	1	113
280	1933-34	2056	1	109
280	1933	2051	1	113
280	1933-34	2056	1	109
281	1933	2051	1	113
281	1933	2056	1	109
288	1933	2051	1	113
288	1933	2056	1	109
288-5	1932	2022	1	61
289	1933	2051	1	113
291	1932	2022	1	63
292	1932	2022	1	63
293	1933	2056	1	109
293-SX	1933-34	2056	1	109
293-X	1933-34	2056-1	1	109
299	1933	2031	1	75
410	1933	2030	1	85
411	1933	2030	1	85
412	1933	2030	1	85
414	1933	2030	1	85
420	1933	2030	1	85
430	1933	2033	1	89
440	1933	2033	1	89
441	1933	2033	1	89
442	1933	2033	1	89
443	1933	2030	1	85
444	1933	2033	1	89
460	1933	2047	1	133
462	1934	2057	1	211
470	1932	2044	1	67
470-5	1932	2056	1	109
470-5A	1932	2056	1	109
472	1933	2031	1	75
472-A	1933	2031	1	75
473	1933	2030	1	85
473-A	1933	2030	1	85

MODEL	YEAR	CHASSIS	VOLUME	PAGE
474	1933	2053	1	121
475	1933	2054	1	125
476	1933	2032	1	101
476-B	1933	2059	1	105
478	1933	2056	1	109
478	1933	2051	1	113
479	1933	2059	1	105
479-A	1933	2059	1	105
500	1932	2037	1	97
501	1932	2037	1	97
502	1932	2037	1	97
503	1932	2037	1	97
514	1932	2037	1	97
515	1932	2037	1	97
516	1932	2037	1	97
516	1932	2031	1	75
516-B	1932	2037	1	97
517	1932	2031	1	75
518	1932	2031	1	75
520	1932	2035	1	93
521	1932	2035	1	93
522	1932	2035	1	93
530	1932	2038	1	79
531	1932	2038	1	79
532	1932	2038	1	79
533	1932	2038	1	79
550-1.0	1933	2031	1	75
558	1932	2051	1	113
558-1.0	1933	2031	1	75
560	1933	2031	1	75
563	1932		1	83
568	1932	2051	1	113
577	1932	2056	1	109
578	1932	2051	1	113
585	1933	2053	1	121
585-1.0	1932	2053B	1	121
588	1932	2056	1	109
588	1933-34	2056	1	109
589	1932	2051	1	113
589	1933	2051-A	1	113
590	1932	2051	1	113
590	1933-34	2056	1	109
593	1932	2056	1	109
590-5	1933-34	2022	1	61
593-10	1933-34	2056	1	109
600	1932	2037	1	97
602	1932	2035	1	93
602	1929		1	1
603	1932	2038	1	79
604	1932	2037	1	97
605	1933	2035	1	93
606	1932	2037	1	97
607A	1933	2033	1	89
608	1932	2035	1	93
610	1932	2037	1	97
611	1932	2035	1	93
612	1932	2038	1	79
612	1929		1	1
615	1932	2035	1	93
616	1932	2037	1	97
617	1932	2038	1	79
618	1932	2037	1	97
619	1932	2033	1	89
620	1932	2038	1	79
621	1932	2035	1	93
621D	1932	2035	1	93
622	1929			1

MODEL	YEAR	CHASSIS	VOLUME	PAGE
623	1932	2038	1	79
624	1932	2038	1	79
642	1929		1	1
650	1934	2057	1	211
654	1934	5901	1	193
657	1934	5901	1	193
660	1935	5616	1	225
660TD	1934	2057	1	211
661TE	1934	2057	1	211
663	1935	5510	1	219
663	1934	2057	1	211
664	1935	5510	1	219
666	1935	5616	1	225
667	1934	5901	1	193
668	1935	5626	1	233
672	1929		1	1
688	1933-34	2056	1	109
701	1933		1	129
702	1933		1	131
703	1933	Revised 702	1	131
705	1933	2052	1	117
706	1933	2052	1	117
707	1933	2052	1	117
711	1933	2052	1	117
712	1933	2052	1	117
712	1930		1	9
715	1933	2053	1	121
715	1932	2053B	1	121
722	1930		1	9
725	1933	2056	1	109
725-S	1933	2056	1	109
732	1930		1	9
750	1933	2052	1	117
755	1933	2053	1	121
756	1933	2053	1	121
757	1933	2054	1	125
760	1933	2054	1	125
765	1933	2054	1	125
767	1933	2054	1	125
770	1933	2032	1	101
770B	1933	2059	1	105
772	1930		1	9
775	1933	2032	1	101
775B	1933	2059	1	105
777	1933	2059	1	105
777	1933	2059	1	105
780	1933	2032	1	101
785	1933	2053	1	121
785	1932	2053B	1	121
788	1933	2059	1	105
788	1933	2059	1	105
801	1934		1	179
805	1934	5502	1	171
806	1934	5504-05	1	175
807	1934	5504-05	1	175
808	1934	5605-07	1	159
809	1934	5605-07	1	159
810	1934	5609	1	167
811	1934	5609	1	167
812	1934	5608	1	163
816	1934	5608	1	163
817	1934	5608	1	163
819	1934	5608	1	163
825	1934	5701	1	151
825R	1934	5703R	1	155
827	1934	5701	1	151
827R	1934	5703R	1	155

MODEL	YEAR	CHASSIS	VOLUME	PAGE
S827	1934	5701R	1	155
829	1934	5701	1	151
829R	1934	5703R	1	155
S829	1934	5701R	1	155
834	1935	1002	1	143
835	1934	1001	1	143
845	1934	5502	1	171
S847	1934	5504-05	1	175
850	1934	5504-05	1	175
860	1934	5605-07	1	159
861	1934	5605-07	1	159
862	1934	5609	1	167
865	1934	5609	1	167
866	1934	5609	1	167
868	1936	5608	1	163
869	1936	5608	1	163
870	1934	5701	1	151
870R	1934	5703R	1	155
871	1934	5703	1	151
S870	1934	5701R	1	155
S871	1934	5701R	1	155
880	1934	1001	1	143
881	1935	1001	1	143
885	1935	1001	1	143
886	1935	1001	1	143
887	1935	2059	1	105
908	1935	5614	1	181
S908	1935	5618	1	185
909	1935	5614	1	181
S909	1935	5618	1	185
922	1931	2014	1	31
934	1935	1002	1	143
935	1935	1001	1	143
945	1935	5508-09	1	189
950	1935	5508-09	1	189
960	1935	5614	1	181
S961	1935	5618	1	185
962	1935	5608	1	163
963	1935	5609	1	167
966	1935	5605-07	1	159
970	1935	5902	1	193
970	1934	5901	1	193
975	1935	5902	1	193
978	1935	1001	1	143
980	1935	1201	1	199
983	1935	1001	1	143
985	1935	1201	1	199
990	1935	1201	1	199
1101	1935	1001	1	143
1105	1935	1001	1	143
1107	1935	1201-L	1	199
1112	1935	5608	1	163
1114	1935	5605-07	1	159
1115	1935	5609	1	167
1116	1935	5608	1	163
1117	1935	5614	1	181
1118	1935	5618	1	185
1160	1935	5605-07	1	159
1162	1935	5609	1	167
1167	1935	5618	1	185
1170	1935	5701R	1	155
1801	1936	5608	1	163
4B106	1937	5406	1	328
4B131	1937	5406	1	328
4B132	1937	5406	1	328
4B231	1938	5409	1	402
4B313	1939	5410	1	462
4B314	1939	5411	1	464
4B317	1939	5411	1	464
4B422	1940	5417	1	580
4B437	1940	5417	1	580
4B466	1940	5417	1	580
4B468	1940	5417	1	580
4B515	1941	4A01	2	4
4B536	1941	4A03	2	4
4B639	1942	4B04	2	167
4F133	1937	5407	1	359
4F227	1938	5408	1	400
4G800	1948	4E41	3	36
4G800Z	1948	4E41Z	3	38
4K016	1946-47	4C52	3	32
4K035	1946-47	4C53	3	32
4K040	1946-47	4C54	3	34
4K310	1939	5412	1	515
4K329	1939	5413	1	517
4K331	1939	5412	1	515
4K332	1939	5414	1	515
4K354	1939	5414	1	515
4K355	1939	5412	1	515
4K400	1940	5416	1	526
4K402	1940	5419	1	530
4K422	1940	5420	1	582
4K435	1940	5420	1	582
4K465	1940	5420	1	582
4K466	1940	5420	1	582
4K515	1941	4A02	2	6
4K535	1941	4A04	2	6
4K570	1941	4A04	2	6
4K600	1942	4B01	2	129
4K616	1942	4B02-03	2	165
4K2616	1942	4B02-03	2	165
4K635	1942	4B02-03	2	165
4K658	1942	4B02-03	2	165
4K640	1942	4B05	2	169
4P26	1936	5401	1	235
4P51	1936	5401	1	235
4T26	1936	5403	1	239
4T61	1936	5403	1	239
4V31	1936	5405	1	271
4V59	1936	5405	1	271
5D011	1946-47	5C01	3	40
5D011Z	1946-47	5C01Z	3	40
5D027	1946-47	5C01	3	40
5D027Z	1946-47	5C01Z	3	40
5D610	1942	5B01	2	131
5D611	1942	5B02	2	171
5D2611	1942	5B02	2	171
5D625	1942	5B01	2	131
5D627	1942	5B02	2	171
5D810	1948	5E02	3	54
5D811	1948	5E01	3	52
5G003	1946-47	5C40	3	44
5G003Z	1946-47	5C40Z	3	46
5G003ZZ	1946-47	5C40ZZ	3	46
5G036	1946-47	5C51	3	50
5G401	1940	5537	1	532

MODEL	YEAR	CHASSIS	VOLUME	PAGE
5G403	1940	5537	1	532
5G405	1940	5537	1	532
5G438	1940	5536	1	584
5G441	1940	5539	1	534
5G442	1940	5539	1	534
5G461	1940	5539	1	534
5G467	1940	5536	1	584
5G484	1940	5538	1	536
5G500	1941	5A01	2	8
5G504	1941	5A03	2	69
5G510	1941	5A10	2	71
5G534	1941	5A10	2	71
5G537	1941	5A02	2	10
5G572	1941	5A02	2	10
5G603	1941	5B07	2	179
5G617	1942	5B05-06	2	177
5G2617	1942	5B05-06	2	177
5G636	1942	5B05-06	2	177
5J196	1938	5524	1	408
5J217	1938	5524	1	408
5J247	1938	5524	1	408
5J255	1938	5524	1	408
5J353	1939	5524	1	408
5K037	1946-47	5C50	3	48
5K637	1942	5B04	2	175
5M90*	1936	5510	1	312
5M191*	1937	5520	1	378
5M191*	1937	5520	1	393
5M291*	1938	5527	1	446
5M294*	1938	5530	1	448
5MX080*	1946-47	5C80	3	222
5R080	1946-47	5C04	3	42
5R086	1946-47	5C02	3	42
5R086Z	1946-47	5C02Z	3	42
5R123	1937	5519	1	375
5R135	1937	5519	1	375
5R165	1937	5519	1	375
5R216	1938	5526	1	406
5R226	1938	5526	1	406
5R236	1938	5526	1	406
5R303	1939	5528	1	466
5R312	1939	5528	1	466
5R316	1939	5528	1	466
5R317	1939	5528	1	466
5R337	1939	5528	1	466
5R680	1942	5B03	2	173
5R680X	1942	5B14	2	183
5R680XJ	1942	5B14	2	183
5R686	1942	5B13	2	181
5R686 Phono Manual			2	93
5S29	1936	5513	1	247
5S56	1936	5513	1	247
5S119	1937	5516	1	332
5S126	1937	5516	1	332
5S127	1937	5516	1	332
5S150	1937	5516	1	332
5S151	1937	5516	1	332
5S161	1937	5516	1	332
5S201	1938	5521	1	404
5S218	1938	5521	1	404
5S220	1938	5521	1	404
5S228	1938	5521	1	404
5S237	1938	5521	1	404
5S250	1938	5521	1	404
5S252	1938	5521	1	404
5S313B	1939	5410	1	462
5S319	1939	5529	1	468
5S320	1939	5529	1	468
5S327	1939	5529	1	468
5S330	1939	5529	1	468
5S338	1939	5529	1	468
5S339	1939	5529	1	468
5X230	1939	5523	1	437
5X248	1939	5523	1	437
5X274	1938	5523	1	437
6B107	1937	5635	1	330
6B129	1937	5635	1	330
6B164	1937	5635	1	330
6B321	1939	5653	1	480
6D014	1946-47	6C01	3	56
6D015	1946-47	6C05	3	58
6D015Z	1946-47	6C05Z	3	58
6D029	1946-47	6C01	3	56
6D030	1946-47	6C05	3	58
6D030Z	1946-47	6C05Z	3	58
6D116	1937	5633	1	334
6D117	1937	5633	1	334
6D118	1937	5633	1	334
6D202	1938	5639	1	412
6D219	1938	5639	1	412
6D221	1938	5639	1	412
6D238	1938	5639	1	412
6D302	1939	5646	1	470
6D311	1939	5646	1	470
6D312	1939	5647	1	472
6D314	1939	5647	1	472
6D315	1939	5657	1	519
6D316	1939	5657	1	519
6D316	1939	5647	1	472
6D317	1939	5647	1	472
6D326	1939	5646	1	470
6D336	1939	5646	1	470
6D337	1939	5647	1	472
6D360	1939	5646	1	470
6D410	1940	5659	1	538
6D411	1940	5659	1	538
6D413	1940	5660	1	540
6D414	1940	5660	1	540
6D425	1940	5659	1	538
6D426	1940	5660	1	540
6D427	1940	5660	1	540
6D446	1940	5660	1	540
6D455	1940	5660	1	540
6D510	1941	6A01	2	10
6D512	1941	6A16	2	73
6D516	1941	6A24	2	133
6D520	1941	6A26	2	135
6D525	1941	6A10	2	12
6D526	1941	6A10	2	12
6D538	1941	6A26	2	135
6D539	1941	6A16	2	73
6D612	1942	6B04	2	191
6D2612	1942	6B04	2	191
6D614	1942	6B01	2	185
6D2614	1942	6B01	2	185
6D615	1942	6B05	2	193

MODEL	YEAR	CHASSIS	VOLUME	PAGE
6D2615	1942	6B05	2	193
6D620	1942	6B14	2	309
6D2620	1942	6B14	2	309
6D621	1942	6B01	2	185
6D622	1942	6B04	2	191
6D623	1942	6B05	2	193
6D628	1942	6B04	2	191
6D629	1942	6B01	2	185
6D630	1942	6B05	2	193
6D644	1942	6B14	2	309
6D815	1948	6E05	3	64
6G001	1946-47	6C40	3	72
6G004Y	1946-47	6C41	3	74
6G038	1946-47	6C50	3	76
6G501	1941	6A19	2	75
6G505	1941	6A19	2	75
6G535	1941	6A25	2	137
6G560	1941	6A25	2	137
6G601	1942	6B03	2	189
6G638	1942	6B09	2	199
6G660	1942	6B09	2	199
6G801	1948	6E40	3	78
6J230	1938	5642	1	416
6J257	1938	5642	1	416
6J322	1939	5654	1	482
6J357	1939	5654	1	482
6J436	1940	5679	1	592
6J463	1940	5679	1	592
6M92*	1936	5632	1	314
6M90S*	1936	5630	1	316
6M90D*	1936	5630	1	316
6M91S*	1936	5631	1	318
6M91D*	1936	5631	1	318
6M192*	1937	5637	1	381
6M192*	1937	5637	1	394
6M193*	1937	5637	1	384
6M193*	1937	5637	1	395
6M194*	1937	5637	1	384
6M194*	1937	5637	1	395
6M292*	1938	5645	1	450
6M293*	1938	5645	1	450
6M295*	1938	5650	1	452
6M390*	1939	Ford	1	511
6MF080*	1946-47	6C80	3	230
6MF490*	1940	Ford	1	570
6MF590*	1941	6A21	2	49
6MF593*	1941	6A23	2	103
6MN595*	1941	6A17	2	41
6MN596*	1941	7A08	2	41
6MF690*	1942	6B19	2	261
6MW693*	1942	6B21	2	269
6MN695	1942	6B22	2	277
6MF780*	1947-48	6C80	3	238
6MF780E*	1947-48	6D80E	3	238
6MH081*	1946-47	6C81 (DB 46)	3	246
6MH089*	1946-47	6C89 (DB 47)	3	254
6MH699*	1942	6B11	2	293
6MH889*	1947-48	6E89 (DB 48)	3	262
6MM790*	1947-48	6D90	3	238
6MM790E*	1947-48	6D90E	3	238
6MN082*	1946-47	6C82	3	270
6MN088*	1946	6C88	3	270

MODEL	YEAR	CHASSIS	VOLUME	PAGE
6MN495*	1940	Nash	1	562
6MN496*	1940	Nash	1	562
6MN788*	1947	6D88	3	270
6MN887*	1948	6E87	3	270
6MN988*	1949	6F88	3	280
6MW083	1946-47	6C83	3	288
6P416	1940	5661	1	542
6P417	1940	5661	1	542
6P418	1940	5662	1	542
6P419	1940	5662	1	542
6P428	1940	5662	1	544
6P429	1940	5662	1	544
6P430	1940	5662	1	544
6P447	1940	5662	1	544
6P448	1940	5662	1	544
6P457	1940	5662	1	544
6R084	1946-47	6C21	3	66
6R087	1946-47	6C22	3	68
6R087Z	1946-47	6C22Z	3	68
6R087ZZ	1946-47	6C22ZZ	3	70
6R481	1940	5675	1	588
6R485	1940	5672P	1	586
6R583	1941	6A08	2	13& 30
6R592	1941	6A08	2	13& 30
6R631	1942	6B02	2	187
6R683	1942	6B05	2	195
6R684	1942	6B05	2	195
6R684 Phono Manual			2	195
6R687	1942	6B05	2	195
6R687 Phono Manual			2	93
6R688	1942	6B05	2	195
6R886	1947-48	6E02	3	62
6S27	1936	5619	1	251
6S52	1936	5619	1	251
6S128	1937	5634	1	338
6S137	1937	5634	1	338
6S147	1937	5634	1	338
6S152	1937	5634	1	338
6S157	1937	5634	1	338
6S171	1937	5634	1	338
6S203	1938	5638	1	414
6S222	1938	5638	1	414
6S223	1938	5638	1	414
6S229	1938	5638	1	414
6S239	1938	5638	1	414
6S241	1938	5638	1	414
6S249	1938	5644	1	418
6S254	1938	5644	1	418
6S256	1938	5644	1	418
6S275	1938	5638	1	414
6S301	1939	5651	1	474
6S304	1939	5651	1	474
6S305	1939	5651	1	474
6S306	1939	5651	1	474
6S321	1939	5651	1	474
6S322	1939	5651	1	474
6S330	1939	5648	1	476
6S340	1939	5651	1	474
6S341	1939	5649	1	478
6S351	1939	5649	1	478
6S352	1939	5649	1	478
6S361	1939	5648	1	476
6S362	1939	5649	1	478
6S439	1940	5678	1	590

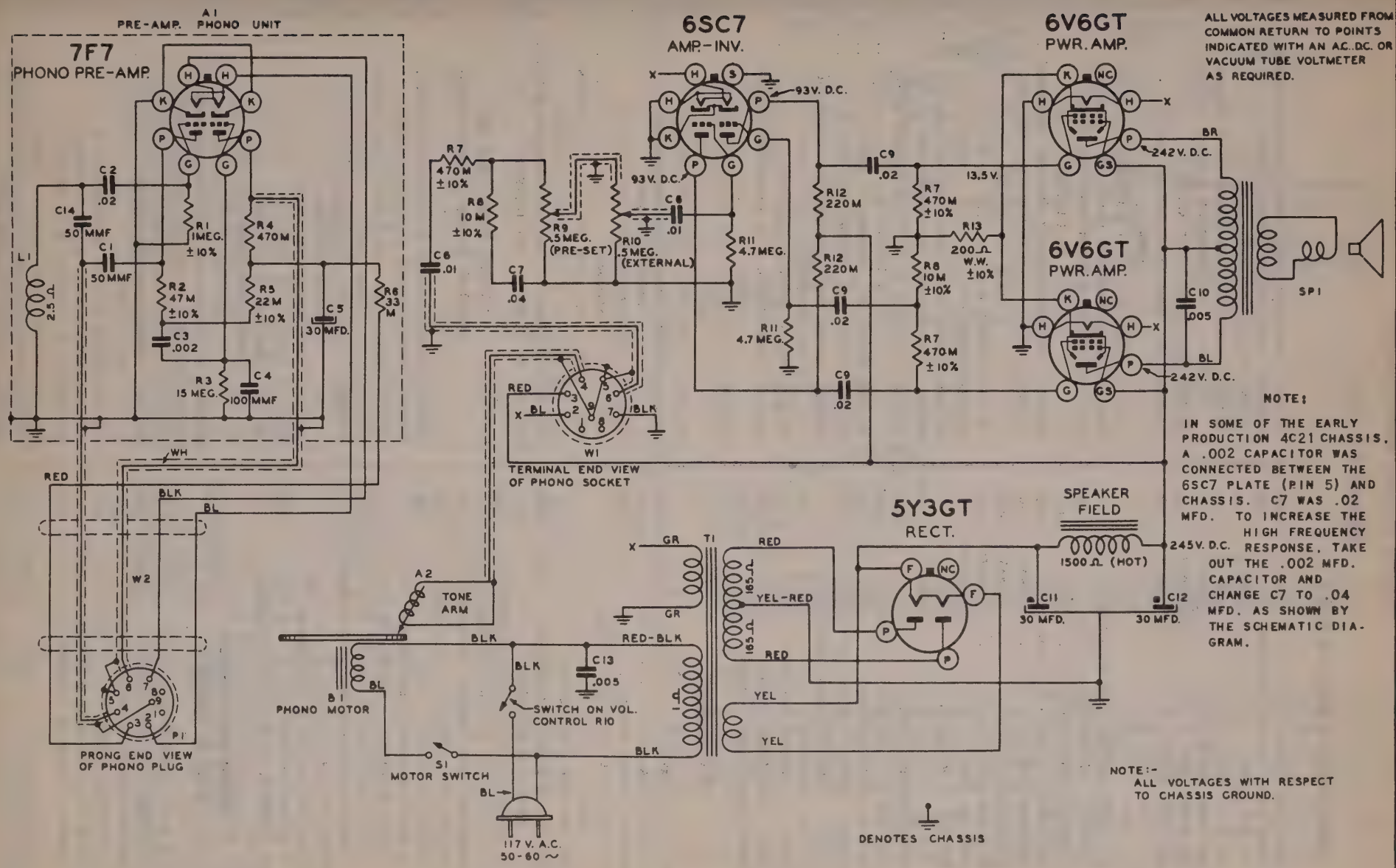
MODEL	YEAR	CHASSIS	VOLUME	PAGE
6S469	1940	5678	1	590
6S511	1941	6A13	2	14
6S511W	1941	6A14	2	14
6S527	1941	6A02	2	14
6S528	1941	6A02	2	14
6S532	1941	6A05R	2	139
6S546	1941	6A05	2	16
6S556	1941	6A05	2	16
6S580	1941	6A04	2	14 & 31
6S596	1941	6A20	2	77
6S596 Phono Manual			2	93
6S596J Phono Manual			2	119
6S597	1941	6A20	2	77
6S597 Phono Manual			2	119
6S597J Phono Manual			2	119
6S632	1942	6B08	2	197
6S646	1942	6B08	2	197
6S656	1942	6B08	2	197
6V27	1936	5621	1	275
6V62	1936	5621	1	275
7D119	1937	5707	1	336
7D126	1937	5707	1	336
7D127	1937	5707	1	336
7D138	1937	5707	1	336
7D148	1937	5707	1	335
7D162	1937	5707	1	336
7D168	1937	5707	1	336
7D203	1938	5710	1	420
7D222	1938	5710	1	420
7D223	1938	5710	1	420
7D229	1938	5710	1	420
7D239	1938	5710	1	420
7D241	1938	5710	1	420
7D243	1938	5710	1	420
7D253	1938	5710	1	420
7G605	1942	7B04	2	311
7H820	1948	7E01	3	82
7H822	1948	7E02	3	84
7J232	1938	5711	1	424
7J259	1938	5711	1	424
7J323	1939	5715	1	484
7J328	1939	5715	1	484
7J368	1939	5715	1	484
7M91S*	1936	5706	1	320
7M91D*	1936	5706	1	320
7ML080*	1946-47	7C80	3	296
7ML081*	1946-47	7C80	3	296
7ML592*	1941	7A09	2	57
7ML780*	1947-48	7C80	3	304
7ML781*	1947-48	7C80	3	304
7R070	1946-47	6C06	3	60
7S28	1936	5704	1	255
7S53	1936	5704	1	255
7S204	1938	5709	1	422
7S232	1938	5709	1	422
7S240	1938	5709	1	422
7S242	1938	5709	1	422
7S258	1938	5709	1	422
7S260	1938	5709	1	422
7S261	1938	5709	1	422
7S323	1939	5714	1	486
7S342	1939	5714	1	486
7S343	1939	5714	1	486
7S363	1939	5714	1	486
7S364	1939	5714	1	486
7S366	1939	5714	1	486
7S432	1940	5719	1	546
7S432	1940	5724	1	594
7S433	1940	5719	1	546
7S433	1940	5724	1	594
7S434	1940	5719	1	546
7S434	1940	5724	1	594
7S449	1940	5719	1	546
7S449	1940	5724	1	594
7S450	1940	5719	1	546
7S450	1940	5724	1	594
7S458	1940	5719	1	546
7S458	1940	5724	1	594
7S459	1940	5719	1	546
7S459	1940	5724	1	594
7S460	1940	5719	1	546
7S460	1940	5724	1	594
7S461	1940	5719	1	546
7S461	1940	5724	1	594
7S462	1940	5719	1	546
7S462	1940	5724	1	594
7S487	1940	5721	1	548
7S487	1940	5725	1	596
7S487 Phono Manual			1	555
7S488	1940	5721	1	548
7S488	1940	5725	1	596
7S488 Phono Manual			1	555
7S490	1940	5721	1	548
7S490	1940	5725	1	596
7S529	1941	7A02	2	20
7S530	1941	7A02	2	20
7S547	1941	7A02	2	20
7S557	1941	7A02	2	20
7S558	1941	7A02	2	20
7S559	1941	7A02	2	20
7S581	1941	7A04	2	20 & 31
7S581 Phono Manual			2	97
7S582	1941	7A04	2	20 & 31
7S582 Phono Manual			2	97
7S584	1941	7A04	2	20 & 31
7S584 Phono Manual			2	97
7S585	1941	7A01	2	18
7S585 Phono Manual			1	555
7S591	1941	7A04	2	20 & 31
7S591 Phono Manual			2	93
7S591J	1941	7A04	2	20 & 31
7S591J Phono Manual			2	119
7S598	1941	7A11	2	141
7S598 Phono Manual			2	93
7S598J Phono Manual			2	119
7S633	1942	7B01	2	201
7S633R	1942	7B01R	2	201
7S634	1942	7B01	2	201
7S634R	1942	7B01R	2	201
7S657	1942	7B01	2	201
7S657R	1942	7B01R	2	201
7S681	1942	7B01R	2	201
7S681 Phono Manual			2	93
7S682	1942	7B02	2	203
7S682 Phono Manual			2	203

MODEL	YEAR	CHASSIS	VOLUME	PAGE
7S685	1942	7B02	2	203
7S685 Phono Manual			2	93
8G005	1946-47-48	8C40	3	96
8G005T (Z1-Z2)	1946-47-48	8C40T (Z1-Z2)	3	100
8H023	1946-47	8C01	3	88
8H023Z	1946-47	8C01Z	3	90
8H032	1946-47	8C20	3	92
8H033	1946-47	8C20	3	92
8H034	1946-47	8C01	3	88
8H034Z	1946-47	8C01Z	3	90
8H050	1946-47	8C20	3	92
8H051	1946-47	8C20	3	92
8H052	1946-47	8C20	3	92
8H061	1946-47	8C20	3	92
8M195*	1937	5803	1	386
8M195*	1937	5803	1	396
8MF880*	1948	8E80	3	306
8MF881*	1948	8E81	3	314
8MF980*	1949	8F80	3	306
8ML682*	1942	8B03	2	285
8ML882*	1948-49	8E82	3	322
8ML882Z*	1948-49	8E82Z	3	322
8ML982*	1948-49	8F82	3	330
8ML982Z*	1948-49	8F82	3	330
8MM890*	1948-49	8E90	3	332
8MM990*	1949	8F90	3	340
8S129	1937	5801	1	340
8S154	1937	5801	1	340
8S359	1939	5807	1	521
8S432	1940	5810	1	616
8S433	1940	5810	1	616
8S434	1940	5810	1	616
8S443	1940	5808	1	598
8S449	1940	5810	1	616
8S450	1940	5810	1	616
8S451	1940	5808	1	598
8S458	1940	5810	1	616
8S459	1940	5810	1	616
8S460	1940	5810	1	616
8S461	1940	5810	1	616
8S462	1940	5810	1	616
8S463	1940	5808	1	598
8S487	1940	5811-P	1	616
8S531	1941	8A02	2	24
8S548	1941	8A02	2	24
8S563	1941	8A02	2	24
8S586	1941	8A01	2	22
8S586 Phono Manual			1	555
8S587	1941	8A03	2	24 - 31
8S587 Phono Manual			2	97
8S588	1941	8A03	2	24 - 31
8S588 Phono Manual			2	97
8S593	1941	8A04	2	79
8S594	1941	8A04	2	79
8S594J Phono Manual			2	111
8S647	1942	8B01	2	205
8S661	1942	8B01	2	205
9H079	1946-47	8C21	3	94
9H081	1946-47	8C21	3	94
9H082	1946-47	8C21	3	94
9H082 Chairside Drive-out Motor Schematic			3	207
9H085	1946-47	8C21	3	94
9H088	1946-47	8C21	3	94
9H881	1948	9E21	3	102
9H882	1948	9E21	3	102
9H885	1948	9E21	3	102
9H888	1948	9E21	3	102
9H984	1948	9F22	3	361
9H984LP	1948	9F22	3	361
9S30	1936	5903	1	259
9S54	1936	5903	1	259
9S55	1936	5903	1	259
9S204	1938	5905	1	426
9S232	1938	5905	1	426
9S242	1938	5905	1	426
9S244	1938	5905	1	426
9S262	1938	5905	1	426
9S263	1938	5905	1	426
9S264	1938	5905	1	426
9S307	1939	5907	1	490
9S324	1939	5907	1	490
9S344	1939	5907	1	490
9S365	1939	5906	1	488
9S367	1939	5907	1	490
9S369	1939	5907	1	490
10H551	1941	10A3	2	81
10H571	1941	10A3	2	81
10H571R	1941	10A3R	2	143
10H573	1941	10A3R	2	143
10S130	1937	1004	1	342
10S147	1937	1004	1	342
10S153	1937	1004	1	342
10S155	1937	1004	1	342
10S156	1937	1004	1	342
10S157	1937	1004	1	342
10S160	1937	1004	1	342
10S443	1940	1005	1	600
10S452	1940	1005	1	600
10S464	1940	1005	1	600
10S470	1940	1005	1	600
10S491	1940	1005	1	600
10S491 Phono Manual			1	555
10S492	1940	1005	1	600
10S492 Phono Manaul			1	555
10S531	1941	10A1	2	26
10S549	1941	10A1	2	26
10S566	1941	10A1	2	26
10S567	1941	10A1	2	26
10S589	1941	10A2	2	26 & 32
10S589 Phono Manual			2	97
10S590	1941	10A2	2	26 & 32
10S590 Phono Manual			2	97
10S599	1941	10A2R	2	144
10S599 Phono Manual			2	153
10S668	1941	10B1	2	207
10S669	1941	10B1	2	207
10S690	1941	10B2	2	207
10S690 Phono Manual			2	225
11S474	1940	1103	1	602
12A57	1936	1202	1	263
12A57-L	1936	1202	1	263
12A58	1936	1202	1	263
12A58-L	1936	1202	1	263
12H090	1946-47-48	11C21	3	104
12H090Z	1946-47-48	11C21Z	3	104

MODEL	YEAR	CHASSIS	VOLUME	PAGE
12H091	1946-47-48	11C21	3	104
12H091-93 Chairside Driveout Schematic			3	207
12H091Z	1946-47-48	11C21Z	3	104
12H092	1946-47-48	11C21	3	104
12H092Z	1946-47-48	11C21Z	3	104
12H093	1946-47-48	11C21	3	104
12H093Z	1946-47-48	11C21Z	3	104
12H094	1946-47-48	11C21	3	104
12H094Z	1946-47-48	11C21Z	3	104
12H650	1942	12B1	2	211
12H670	1942	12B1	2	211
12H671	1942	12B1	2	211
12H678	1942	12A6	2	209
12H678 Phono Manual			2	225
12H679	1942	12A6	2	209
12H679 Phono Manual			2	225
12H689	1942	12B2	2	213
12H689 Phono Manual			2	225
12H691	1942	12B2	2	213
12H691 Phono Manual			2	225
12H695	1942	12B2	2	213
12H695 Phono Manual			2	225
12H696	1942	12B2	2	213
12H696 Phono Manual			2	225
12S205	1938	1204	1	428
12S232	1938	1204	1	428
12S245	1938	1204	1	428
12S265	1938	1204	1	428
12S266	1938	1204	1	428
12S267	1938	1204	1	428
12S268	1938	1204	1	428
12S345	1939	1206	1	492
12S370	1939	1206	1	492
12S371	1939	1206	1	492
12S374	1939	1204	1	428
12S445	1940	1207	1	604
12S453	1940	1207	1	604
12S471	1940	1207	1	604
12S475	1940	1207	1	604
12S494	1940	1207	1	604
12S494 Phono Manual			1	555
12S550	1941	12A3	2	28
12S550Z	1941	12A1	2	83
12S568	1941	12A3	2	28
12S568Z	1941	12A1	2	83
12S569	1941	12A3	2	28
12S569E	1941	12A1	2	83
12S569Z	1941	12A1	2	83
12S595	1941	12A4	2	28 - 32
12S595 Phono Manual			2	97
12S595Z	1941	12A2	2	85
12S595Z Phono Manual			2	97
12U158	1937	1203	1	346
12U159	1937	1203	1	346
14H697	1942	14B1	2	313
14H789	1947-48	13D22	3	108
15S308	1939	1502	1	494
15S346	1939	1502	1	494
15S372	1939	1502	1	494
15S373	1939	1502	1	494
15S479	1940	1503	1	606
15S495	1940	1503	1	606
15S495 Phono Manual			1	555
15U246	1938	1501	1	430
15U269	1938	1501	1	430
15U270	1938	1501	1	430
15U271	1938	1501	1	430
15U272	1938	1501	1	430
15U273	1938	1501	1	430
16A61 Str.	1936	1601C	1	279
16A61 Str.	1936	1601P	1	279
16A63 Str.	1936	1601P	1	279
22H698	1942	22B1	2	315-17
22H698 Phono Manual			2	249
22H699	1942	22B1	2	315-17
22H699 Phono Manual			2	249
S-8500 Record Player			2	30
S-8500Z Record Player			2	84
S-8501 Record Player			2	30
S-8501Z Record Player			2	84
S-9000 Record Player			2	84
S-9000 Wireless Record Player			2	93
S-9001 Record Player			2	214
S-9002 Record Player			2	214
S-9005		6B25	2	319
S-11468 Record Changer			3	110
S-11680 Record Changer			3	126
S-13675 Record Changer			3	158
S-14001 Record Changer			3	142
S-14002 Record Changer			3	158
S-14004 Record Changer			3	178
S-14006 Record Changer			3	158
S-14007 Record Changer			3	178
S-14008 Record Changer			3	158
Radio Nurse	1939	RA-TA	1	441
Strato. 1st. Ser.	1935	2501-C	1	287
Strato. 2nd		2501-C	1	299
Ser.	1935	2501-P	1	299
Tube Data Sheet				367
Phono. Circ.	1938			432
Phono. Connections	1939		1	496
Phono. Connections	1940		1	608
Ravox	1940		1	618
Record Changer	1938		1	507
Record Changer	1939		1	503
Record Changer	1940		1	556
Record Changer	1939	S6622	1	523
Record Player	1940	S7000	1	550
Record Player	1940	S7001	1	550
Record Player	1940	S7002	1	550
Record Player	1940	S7003	1	550
Readjustment of Tuning Units (42 Automotive Receivers)				
Record Changer E-1			2	93
Record Changer W-2			2	97
Record Changer & Recorder S-1			2	11

MODEL	YEAR	CHASSIS	VOLUME	PAGE
Record Changer W-3			2	119
Record Changer W-4			2	153
Record Changer S-2			2	225
Record Changer W-5			2	249
Household Service Bulletin No. 1			3	182
Household Service Bulletin No. 2			3	186
Household Service Bulletin No. 3			3	194
Household Service Bulletin No. 4			3	202
Ford Mercury Integral Antenna			3	342
Auto Radio Service Bulletin No. 1			3	344
Auto Radio Service Bulletin No. 2			3	347
Auto Radio Service Bulletin No. 3			3	350
Auto Radio Service Bulletin No. 4			3	354
Auto Radio Service Bulletin No. 5			3	357

* Indicates automotive receivers.



MODEL S 12600
CHASSIS No. 4C21

PARTS LIST

S12600 RECORD DEMONSTRATOR

(Chassis 4C21)

POWER SUPPLY & AMPLIFIER PARTS

11-87	LINE CORD & PLUG	.65
15-34	PHONO CABLE CAP & INSULATOR	.066
22-196	.01 MFD. (C6) 600 V.	.20
22-830	.02 MFD. (C9) 600 V.	.20
22-1041	.005 MFD. (C13) 400 V.	.20
22-1202	.04 MFD. (C7) 400 V.	.20
22-1135	.005 MFD. (C10) 600 V.	.20
22-1496	DRY ELECTROLYTIC - 30 X 30 MFD. 450 V. (C11 & C12)	2.75
46-577	VOLUME CONTROL KNOB	.07
52-367	TWO CONDUCTOR SHIELDED LEAD	.60
63-296	200M OHM (R12) ½ WATT	.09
63-602	4.7 MEGOHM (R11) ½ WATT	.09
63-641	10 M OHM (R8) ½ WATT	.09
63-659	470M OHM (R7) ½ WATT	.09
63-1189	200 OHM W. W. (R13) 2 WATT INSL.	.36
63-1472	VOLUME CONTROL (R9)	1.20
69-85	#10 - 32 X 1" R.H.M.S. (4 USED)	.83C
78-128	SOCKET - SPEAKER PLUG	.12
78-376	SOCKET - OCTAL TUBE (8 CONTACT)	.12
78-582	SOCKET - PHONO (USED ON S12637) (9 CONTACT)	.20
78-640	SOCKET - ELECTROLYTIC COND.	.05
95-961	POWER TRANSFORMER (T1)	7.35
S12637	PHONO CABLE ASSEM. (W1)	5.14

MISCELLANEOUS

19-123	PHONO UNIT MTG. CLIP (3 USED)	.10
49-556	8" DYN. SPEAKER	10.00
	206-556 OUTPUT TRANS.	2.29
	207-556 FIELD COIL (NOT REPLACEABLE)	
	208-556 CONE & VOICE COIL	2.63
54-31	#10 - 32 X 3/8 X 1/8 HEX NUT	.43C
63-1471	VOL. CONTROL & SW. (R10)	1.81
69-85	#10 - 32 X 1" R.H. MACHINE SCREW	.83C
80-407	PHONO UNIT MTG. SPRING (4 USED)	.02
112-544	PHONO UNIT MTG. SCREW (3 USED)	.11
125-56	SPEAKER MTG. GROMMET (4 USED)	.05
202-444	INSTRUCTION BOOK	.18
S12690	PRE-AMP PHONO UNIT (SEE S11680 SERVICE MANUAL. PARTS ARE SAME AS S11690 PRE-AMP EXCEPT R5 WHICH IS 63-644-22M ½W RESISTOR).	
S12650	RECORD PLAYER ASSEM.	
S12653	MOTOR CONTROL SW. & ESCUTCHEON ASSEM. (85-386)	.38
S12654	VOL. CONTROL KNOB ASSEM. (46-609)	.43

S12650 RECORD PLAYER (USED ON S12600)

S11100	TONE ARM LIFT PIN ASSEM. (OR S13086)	.64
S11111	TURNTABLE SHAFT & BEARING ASSEM.	1.26
S11118	IDLER WHEEL ASSEM.	.85
S11442	RECORD LOCATING STUD & SPRING ASSEM. (USED ON S12659)	.09
S11445	TURNTABLE DRIVE SHAFT BEARING ASSEM.	1.02
S11657	IDLER STUD & WASHER ASSEM.	.27
S12638	TURNTABLE ASSEM.	1.89
S12651	COBRA TONE ARM & CARTRIDGE ASSEM. (COMPLETE)	
S12657	MAIN BASE PLATE ASSEM.	8.04
S12658	TONE ARM PIVOT SHAFT & BRKT. ASSEM.	.51
19-146	MOTOR MTG. CLIP (3 USED)	.03
34-128	IDLER SPROCKET GEAR	.05
34-142	TURNTABLE SHAFT SPROCKET GEAR (PART OF S12656)	.05
43-88	TONE ARM SUPPORT HOUSING (CASTING)	.80
54-209	#10 - 3# X 5/16 SPECIAL HEX. NUT (USED ON S11100)	.07
56-172	RECORD PIN	.38
57-1189	NAMEPLATE	.68
80-138	IDLER WHEEL RETAINING SPRING	.012
80-368	IDLER WHEEL TENSION SPRING	.07
80-384	LOCATING STUD RETURN SPRING (USED ON S11442)	.02
80-468	MOTOR MTG. SPRING (2 USED)	.011
80-469	MOTOR MGT. SPRING (1 USED)	.012
93-672	IDLER WHEEL STUD WASHER (USED ON S11657)	.055
93-673	IDLER WHEEL STUD WASHER	.037
93-677	IDLER WHEEL STUD FISHPAPER WASHER LARGE	.45C
93-678	IDLER WHEEL STUD FISHPAPER WASHER SMALL	.33C
93-679	IDLER WHEEL STUD FELT WASHER	1.30C
93-716	MOTOR MTG CUP WASHER (USED ON S12657) (3 USED)	.037
94-468	CLUTCH DRIVE BUSHING (USED ON S12656)	.46
112-415	#8 - 32 X 3/8 FLAT HD. S.T. SCREW	.01
112-579	#8 - 32 X 3/8 R.H.S.T. SCREW	.01
115-24	#4 - 40 X 3/16 FILLISTER HD. M.S.	.30C
141-92	A. C. MOTOR (OR 141-94)	7.45

S12651 COBRA TONE ARM (USED ON S12650 RECORD PLAYER)

S12613	NEEDLE SOCKET & CARTRIDGE ASSEM.	3.00
S12614	COBRA NEEDLE CARTRIDGE ASSEM.	2.50
S12651	COBRA TONE ARM & CARTRIDGE ASSEM. (COMPLETE)	
S12665	COBRA TONE ARM HINGE PLATE ASSEM. (COMPLETE)	2.82
12-1123	TONE ARM SWIVEL BRKT.	.15
12-1142	SOCKET MTG. BRKT.	.02
56-140	TONE ARM PIVOT PIN	.10
56-144	SOCKET RETAINING PIN (USED ON S12613)	.044
56-171	RETAINING PIN (USED ON S12613)	.042
73-75	#4-40 X 1/8 ALLEN HEAD SET SCREW (CONEPOINT)	.10
80-414	SOCKET TENSION SPRING	.09
83-1121	FELT STRIP	.006
112-436	#2-56 X 3/16 BINDING HD. M. S.	.41C
112-437	#2 X 1/8 R. H. S. T. SCREW	.009
112-438	#1 X 3/16 R.H.S.T. SCREW	1.79C
112-573	#2-32 X 1/4 R.H.S.T. SCREW	.01
125-47	RUBBER GROMMET	.03
148-51	TONE ARM HOUSING ONLY	.75

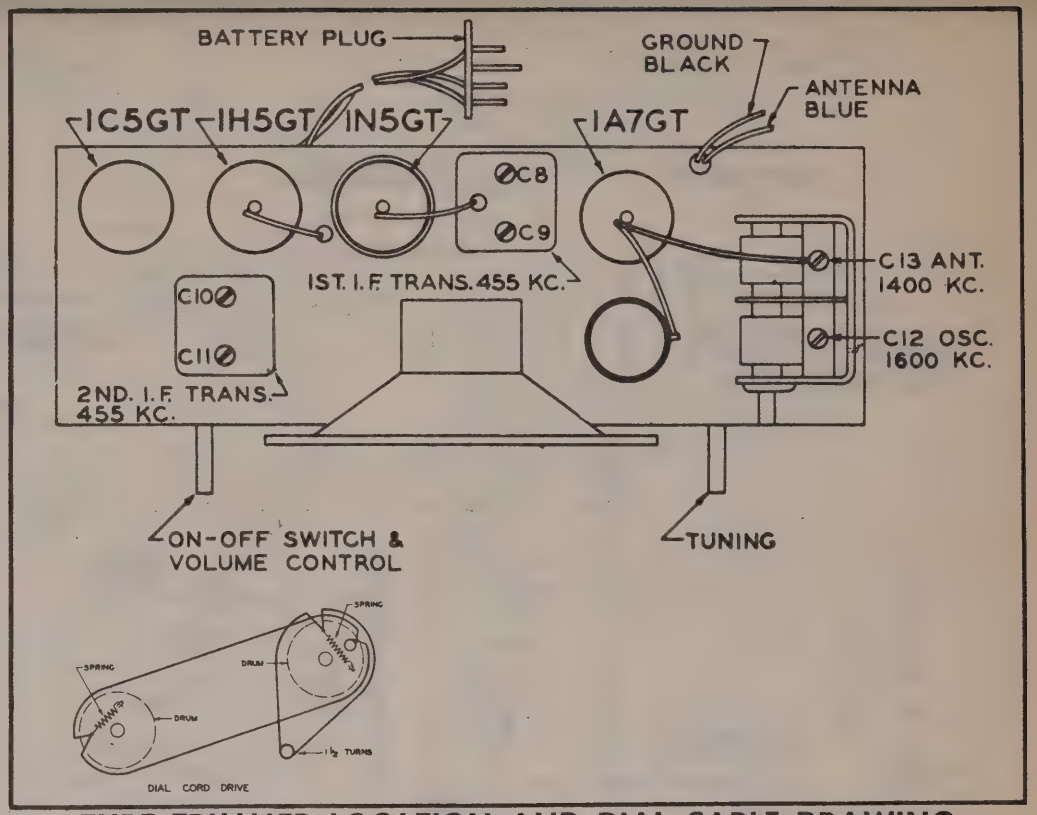
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

PARTS LIST

PARTS FOR CHASSIS 4C52 AND 4C53 ARE INTERCHANGEABLE EXCEPT WHERE OTHERWISE INDICATED

PART NO.		PRICE
	DIAL ASSEMBLY	
26-340	Dial Scale (4C52)	.27
26-339	Dial Scale (4C53)	.24
59-122	"On-Off" Indicator	.12
59-160	Dial Pointer	1.14
76-335	Tuning Control Shaft	.07
78-420	Tuning Control Shaft (4C52)	.20
80-153	Indicator Spring	.03
80-209	Dial Cord Tension Spring	.03
80-471	Tuning Shaft Spring	1.31C
159-50	Plug Button (Dial Scale Mtg.)	.01
188-32	Retaining Ring	1.03C
188-34	Retaining Ring	1.20C
S9588	Indicator Cam Assem.	.07
S9610	Dial Cord and Eyelet Assem. (Long)	.12
S9751	Pulley and Rivet Assem. (On Gang)	.12
59S10944	Pointer and Pulley Assem. (4C52)	.12
11S11128	Dial Cord and Eyelet Assem. (4C52)	.07
S11362	Pointer Pulley and Bushing Assem.	.11
S13034	Dial Cord and Eyelet Assem. (Short)	.07
	COILS AND CHOKES	
95-814	1st I. F. Transformer (T1)	1.77
95-839	2nd I. F. Transformer (T2)	1.77
S12014	Oscillator Coil Assem. (L2)	.77
S12024	Antenna Coil Assem. (L1)	.98
	CONDENSERS	
22-162	.0001 Mfd. (C3) 500 V.	.20
22-196	.01 Mfd. (C4) 600 V.	.20
22-448	.004 Mfd. (C6) 600 V.	.20
22-684	Dry Electrolytic - 8 Mfd. (C7) 150 V.	.45
22-829	.05 Mfd. (C2) 200 V.	.20
22-1453	Two Gang Variable (C1-4C53)	3.85
22-1454	Two Gang Variable (C1-4C52)	3.85
	RESISTORS	
63-271	1 Megohm (R7) 1/4 Watt	.09
63-583	1M Ohm (R10) 1/4 Watt	.09
63-587	4700 Ohm (R5) 1/4 Watt	.09
63-594	68M Ohm (R2) 1/4 Watt	.09
63-600	2.2 Megohm (R8) 1/4 Watt	.09
63-634	820 Ohm (R9) 1/4 Watt	.09
63-654	180M Ohm (R1) 1/4 Watt	.09
63-669	3.9 Megohm (R3) 1/4 Watt	.09
63-976	15 Megohm (R6) 1/4 Watt	.09
63-1235	Volume Control and Switch (R4)	1.81
63-1351	Volume Control and Switch (R4-4C52)	1.81
	MISCELLANEOUS	
2-106	Cabinet Back (4C52)	.13
12-1040	Handle Bracket (4C52)	.02
14-916	Model 016 Bakelite Cabinet (Walnut - 4C52)	5.90
49-519	5" P.M. Speaker (4C52)	7.75
	206-519 Output Transformer	1.97
	208-519 Cone and Voice Coil	1.73
49-450	6-1/2" P.M. Speaker	7.24
	206-450 Output Transformer	1.67
	208-450 Cone and Voice Coil	1.97
52-190	Speaker Cable	.19
57-11A	Antenna Lead Marker	.03
57-11G	Ground Lead Marker	.03
58-74	Battery Cable Plug	.12
78-611	Socket - Octal (8 Contact)	.12
93-258	Brown Felt Washer	.78C
93-546	Brown Felt Washer (4C52)	
110-122	Grille Cloth (4C52)	
112-273	Chassis Mounting Screw (4C52)	
114-134	#8 x 1 1/16" Hex Washer Hd. S. T. Screw (Chassis Mtg.)	1.20C
126-379	Tube Shield	.07
159-42	Back Retaining Button (4C52)	.02
188-32	Retaining Ring (4C52)	1.03C
188-34	Retaining Ring (4C52)	1.20C
192-80	Dial Crystal (4C52)	2.00
192-90	Dial Crystal	.50
196-64	Dial Crystal Gasket	.08
202-382	Instruction Book	.08
S11439	Cabinet Handle and Stud Assem. (36-26 - 4C52)	.48
S11558	Vol. Con. and Tuning Knob and Ring (46-520)	.28

PRICES SUBJECT TO CHANGE WITHOUT NOTICE 15M 2-22-47



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

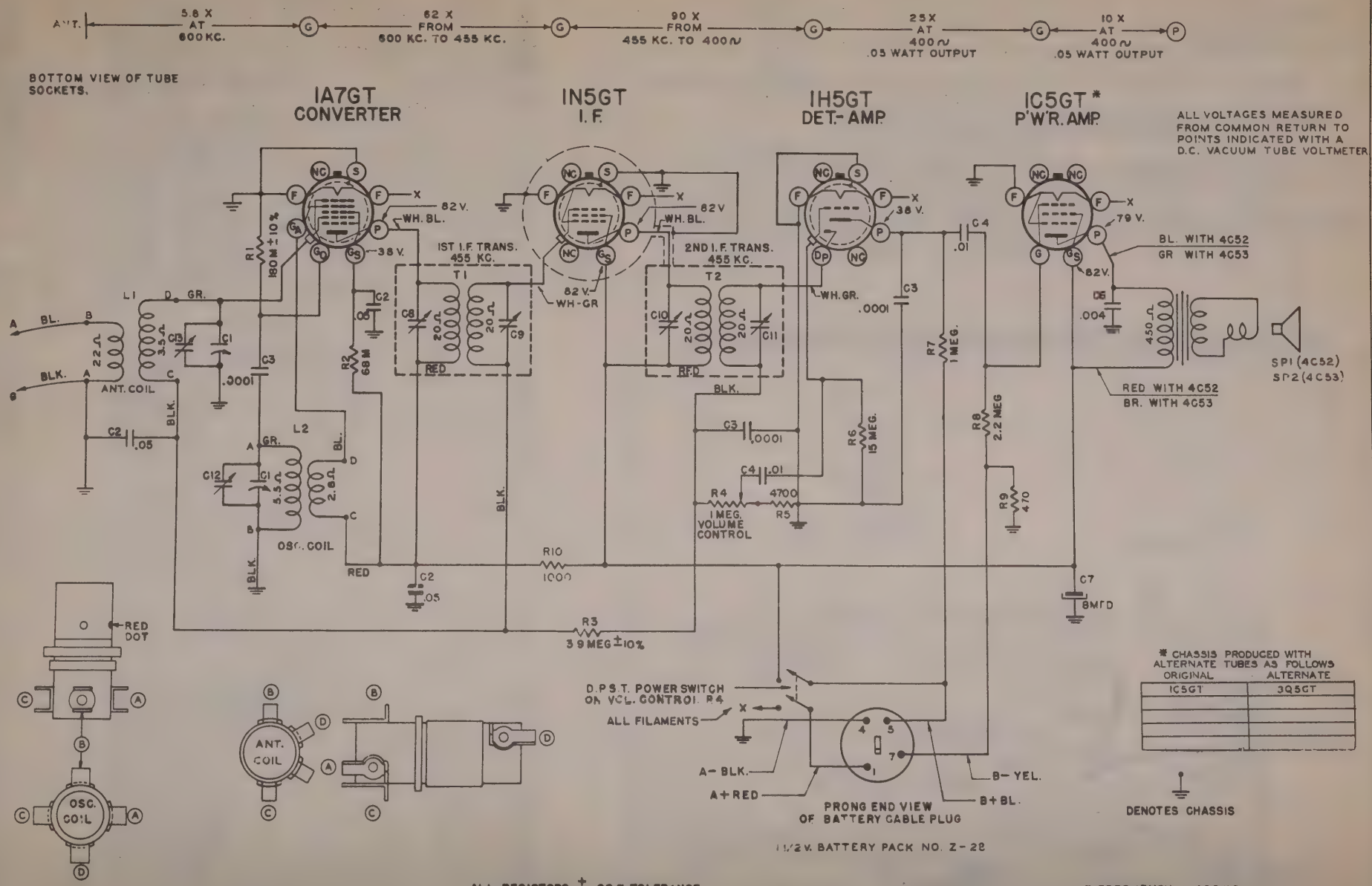
The alignment of this chassis is conventional.

A 4700 ohm resistor R5 between the low end of the volume control and ground allows some audio output with normal signal input when the volume control is in counter clockwise positions. This is the Guardian Reminder circuit.

If the audio output is objectionably high (with the volume control in counter clockwise position) resistor R5 may be reduced in value to 2500 ohms or removed from the circuit and the low end of the control grounded.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd	455 Kc.	600 Kc.	C-8, C-9, C-10, C-11	Align I. F.
2	Antenna and Ground	200 mmfd.	1600 Kc.	1600 Kc.	C-12	Set Oscillator to Dial Scale.
3	Antenna and Ground	200 mmfd.	1400 Kc.	1400 Kc.	C-13	Align Antenna Stage.


ANT.
5.8 X AT 600 KC.
G
62 X FROM 600 KC. TO 455 KC.
G
90 X FROM 455 KC. TO 400 ~
G
25 X AT 400 ~ .05 WATT OUTPUT
G
10 X AT 400 ~ .05 WATT OUTPUT
P
BOTTOM VIEW OF TUBE SOCKETS.
1A7GT CONVERTER
1N5GT I.F.
1H5GT DET.-AMP.
1C5GT * P'W'R. AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER
82 V.
WH. BL.
38 V.
82 V.
WH-GR
38 V.
WH. GR.
79 V.
82 V.
BL. WITH 4C52
GR WITH 4C53
RED WITH 4C52
BR. WITH 4C53
SP1 (4C52)
SP2 (4C53)
IST I.F. TRANS. 455 KC.
2ND I.F. TRANS. 455 KC.
T1
T2
L1
L2
ANT. COIL
OSC. COIL
R1 180 M ± 10%
R2 68 M
R3 3.9 MEG ± 10%
R4 1 MEG. VOLUME CONTROL
R5 4700
R6 15 MEG.
R7 1 MEG.
R8 2.2 MEG
R9 470
R10 1000
C1 .0001
C2 .05
C3 .0001
C4 .01
C5 .004
C7 8 MFD
C8 20 µµF
C9 20 µµF
C10 20 µµF
C11 20 µµF
C12
RED DOT
D.P.S.T. POWER SWITCH ON VOL. CONTROL R4
ALL FILAMENTS
A- BLK.
A+ RED
B- YEL.
B+ BL.
PRONG END VIEW OF BATTERY CABLE PLUG
1½ V. BATTERY PACK NO. Z-28
* CHASSIS PRODUCED WITH ALTERNATE TUBES AS FOLLOWS
ORIGINAL
ALTERNATE
1C5GT
3Q5GT
DENOTES CHASSIS
ALL RESISTORS ± 20 % TOLERANCE UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY 455 KC.
TUNING RANGE 535 - 1620 KC.

PARTS LIST

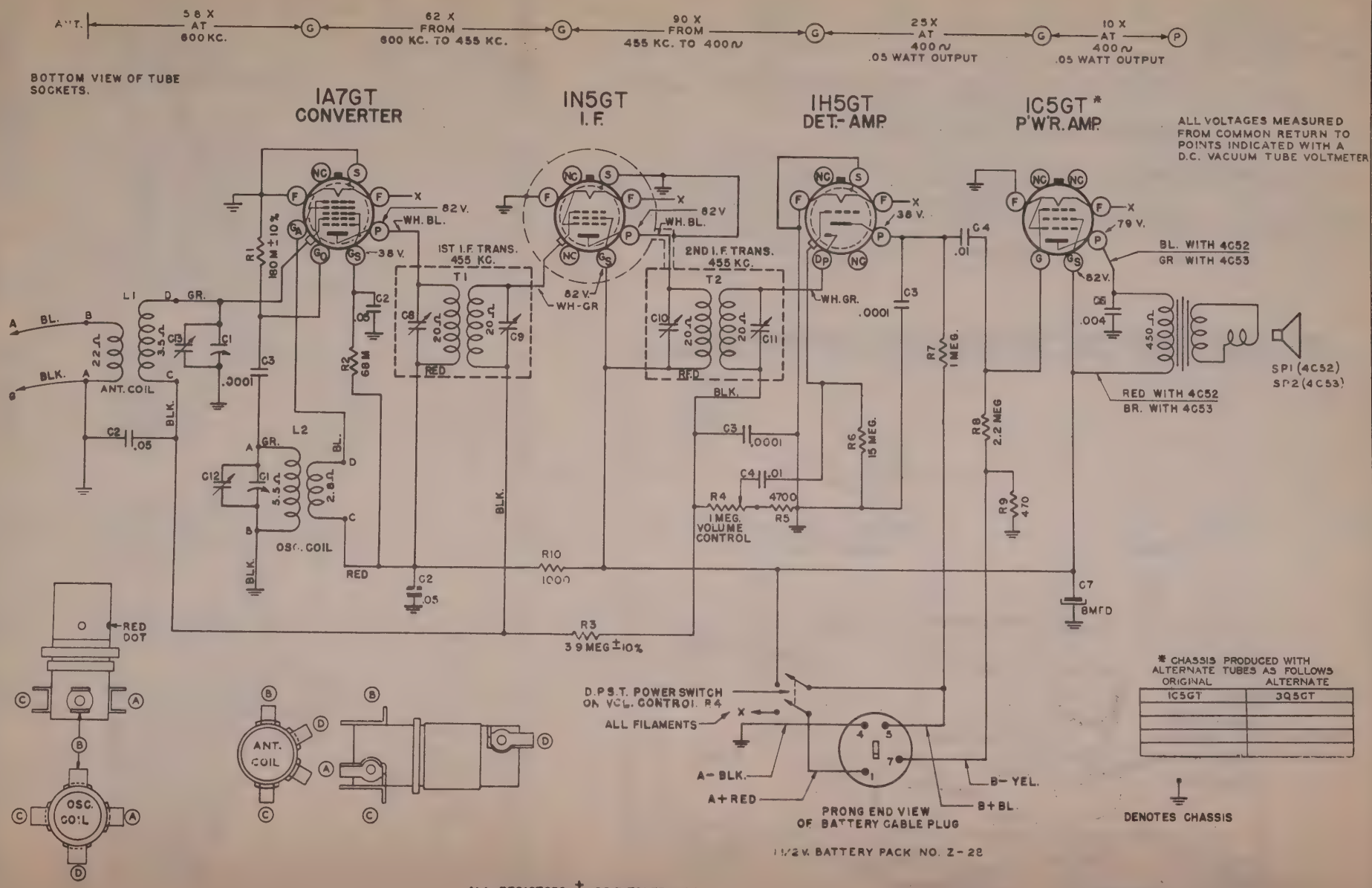
RESISTORS

63-260	100M Ohm (R1)	1/4 Watt	.09
63-271	1 Megohm (R8)	1/4 "	.09
63-311	15M Ohm (R3)	1/4 "	.09
63-581	470 Ohm (R10)	1/4 "	.09
63-587	4700 Ohm (R2)	1/4 "	.09
63-594	68M Ohm (R6)	1/4 "	.09
63-600	2.2 Megohm (R9)	1/4 "	.09
63-620	33 Ohm (R11)	1/4 "	.09
63-669	3.9 Megohm (R4)	1/4 "	.09
63-976	15 Megohm (R7)	1/4 "	.09
63-1236	Volume Control & Switch (R5)		1.81

MISCELLANEOUS

49-522	6½" P.M. Speaker	10.00
	206-522 Output Transformer	2.21
	208-522 Cone & Voice Coil	2.09
52-190	Speaker Cable	.19
54-34	#6-32 x 1/4 x 3/32 Hex Nut	.31C
57-11A	Antenna Marker	.024
57-11G	Ground Marker	.024
57-900	Dial Mtg. Plate	.35
57-1159	Radiorgan Escutcheon Plate (2 used)	.18
58-74	Battery Cable Plug	.12
70-124	#2 x 3/8 Phillips Hd. Wood Screw - Brass Plated (57-1159)	1.70C
78-436	Miniature Tube Socket	.19
78-611	Octal Base Tube Socket (3 used)	.12
85-279	Band Selector Switch	.72
85-284	Radiorgan Switch L.H. (Voice & Alto)	.55
85-288	Radiorgan Switch R.H. (Treble & Bass)	.55
93-125	#6 Internal Shakeproof Lockwasher	.31C
93-258	Brown Felt Washer (Knobs)	.78C
94-295	Steel Bushing (Radiorgan) (4 used)	.036
112-56	#6-1/4 Hex Hd. Self Tapping Screw	.55C
114-67	#6-32 x 7/16 Hex Acorn Hd. M.S. Steel N.P. (Radiorgan) (4 used)	.43C
114-162	#8 x 7/8 Hex Acorn Hd. Self Tapping Screw (Chassis Mtg.)	1.20C
125-17	Rubber Grommets (85-284 & 288)	.03
125-39	Rubber Grommets	.02
126-379	Tube Shield	.07
159-14	Plug Buttons (Dial Scale)	.78C
188-32	Retainer Ring (76-335)	1.03C
188-34	Retainer Ring (S-11362)	1.20C
188-48	Control Knob Decorative Ring	.035
202-384	Instruction Book	.15

Prices subject to change without notice.


ANT.
58 X AT 600 KC.
G
62 X FROM 600 KC. TO 455 KC.
G
90 X FROM 455 KC. TO 400~
G
25X AT 400~ .05 WATT OUTPUT
G
10 X AT 400~ .05 WATT OUTPUT
P
BOTTOM VIEW OF TUBE SOCKETS.
1A7GT CONVERTER
1N5GT I.F.
1H5GT DET.-AMP.
1C5GT * P'W'R. AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER
82 V.
WH. BL.
38 V.
82 V.
WH-GR
38 V.
79 V.
82V.
BL. WITH 4C52
GR WITH 4C53
RED WITH 4C52
BR. WITH 4C53
SP1 (4C52)
SP2 (4C53)
1ST I.F. TRANS. 455 KC.
2ND I.F. TRANS. 455 KC.
T1
T2
RED
BLK.
WH. GR.
L1
L2
ANT. COIL
OSC. COIL
R1 180M ±10%
R2 68M
R3 3.9 MEG ±10%
R4 1 MEG. VOLUME CONTROL
R5 4700
R6 15 MEG.
R7 1 MEG.
R8 2.2 MEG
R9 470
R10 1000
C1 .0001
C2 .05
C3 .0001
C4 .01
C5 .004
C6 .05
C7 8MFD
C8 20 µµF
C9 20 µµF
C10 20 µµF
C11 20 µµF
C12
3.5 Ω
5.5 Ω
2.8 Ω
450 Ω
RED DOT
ANT. COIL
OSC. COIL
D.P.S.T. POWER SWITCH ON VOL. CONTROL R4
ALL FILAMENTS
A- BLK.
A+ RED
B- YEL.
B+ BL.
PRONG END VIEW OF BATTERY CABLE PLUG
1½ V. BATTERY PACK NO. Z-28
* CHASSIS PRODUCED WITH ALTERNATE TUBES AS FOLLOWS
ORIGINAL
ALTERNATE
1C5GT
3Q5GT
DENOTES CHASSIS
ALL RESISTORS ± 20 % TOLERANCE UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY 455 KC.
TUNING RANGE 535-1630 KC.

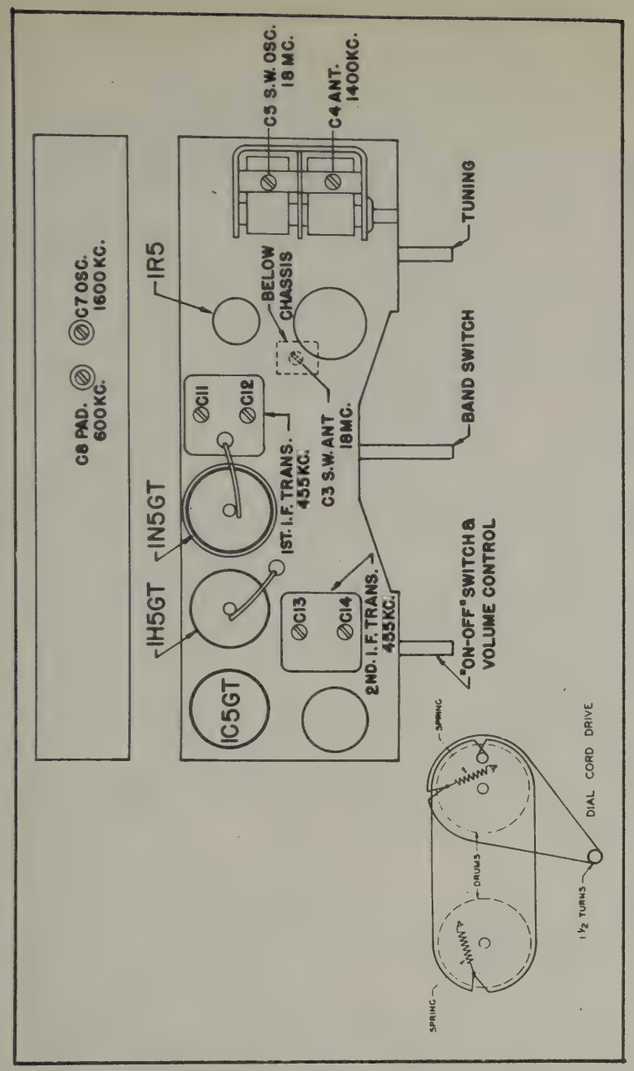
MODELS 4K040-4K040G
CHASSIS No. 4C54

TO THE SERVICE MAN:

The alignment of this receiver is conventional. An output meter, connected across the voice coil of the speaker, is very helpful in making correct adjustments.

The Guardian Reminder Circuit consist of a 4700 ohm resistor (R2) in series with the low side of the volume control. With this circuit, it is impossible to turn the volume completely off and leave the power on. In some cases where the minimum volume is too high even at the lowest setting of the volume control, R2 may be changed to a lower value or shorted out completely.

TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING



ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	BC	600 Kc.	C-11,C-12, C-13,C-14	Align I.F.
2	Ant.-Gnd.	400 ohms	18 Mc.	SW	18 Mc.	C-5	Set Osc. to Scale
3	Ant.-Gnd.	400 ohms	400 ohms	SW	Rock Gang 18 Mc.	C-3	Align Antenna
4	Ant.-Gnd.	200 Mmf.	1600 Kc.	BC	1600 Kc.	C-7	Set Osc. to Scale
5	Ant.-Gnd.	200 Mmf.	1400 Kc.	BC	1400 Kc.	C-4	Align Antenna
6	Ant.-Gnd.	200 Mmf.	600 Kc.	BC	Rock Gang 600 Kc.	C-8	Adjust Padder

PARTS LIST

DIAL ASSEMBLY

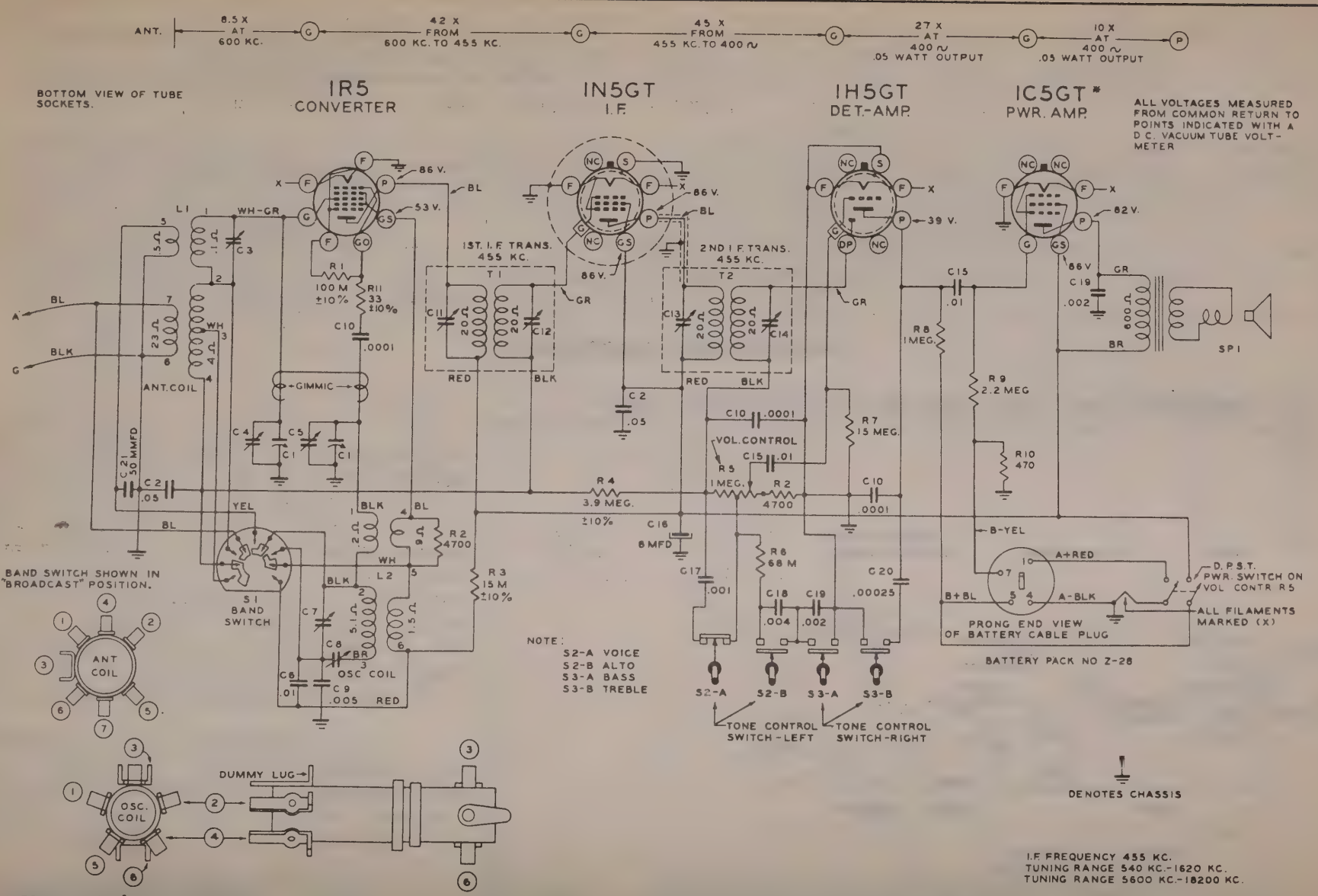
26-342	Dial Scale	.32
46-443	Radiogran Knob (Voice)	.07
46-444	" " (Treble)	.07
46-445	" " (Alto)	.07
46-446	" " (Bass)	.07
59-122	Off & ON Indicator	.12
59-160	Dial Pointer	1.14
76-335	Tuning Control Shaft	.07
80-183	Indicator Spring	.024
80-209	Dial Cord Tension Spring	.024
80-471	Tuning Shaft Spring	1.31C
93-690	Felt Washer (S-11362)	.60C
192-90	Dial Crystal	.50
196-64	Dial Crystal Gasket	.08
S9588	Indicator Cam Assem.	.07
S9610	Dial Cord & Eyelet (Pointer)	.12
S9733	Dial Cord & Eyelet (Gang Cond.)	.07
S9751	Pulley & Rivet Assem. (Gang Cond.)	.12
S11362	Pulley & Bushing Assem. (Pointer)	.11
S11558	Vol. & Tuning Knob Assem. (2 used) (46-520)	.28
S12305	Band Switch Knob Assem. (46-598)	.32

COILS & CHOKES

95-838	1st I.F. Transformer (T1)	1.77
95-839	2nd I.F. Transformer (T2)	1.77
S9829	Osc. Coil Assem. (L2)	1.39
S9832	Ant. Coil Assem. (L1)	1.39

CONDENSERS

22-162	.0001 Mfd. (C10)	600 V.	.20
22-182	.00025 Mfd. (C20)	600 V.	.26
22-196	.01 Mfd. (C15)	600 V.	.20
22-448	.004 Mfd. (C18)	600 V.	.20
22-492	.002 Mfd. (C19)	600 V.	.20
22-684	Dry Electrolytic 8 Mfd. (C16)	150 V.	.45
22-826	.01 Mfd. (C6)	200 V.	.20
22-829	.05 Mfd. (C2)	200 V.	.20
22-887	.001 Mfd. (C17)	600 V.	.20
22-1022	.005 Mfd. (C9)	600 V.	.38
22-1208	Two Section Gang (C1)		2.56
22-1239	Two Section Trimmer (C7 & C8)		.58
22-1240	Single Section Ceramic Trimmer (C3)		.20
22-1532	50 Mmfd. (C21)	500 V.	.20

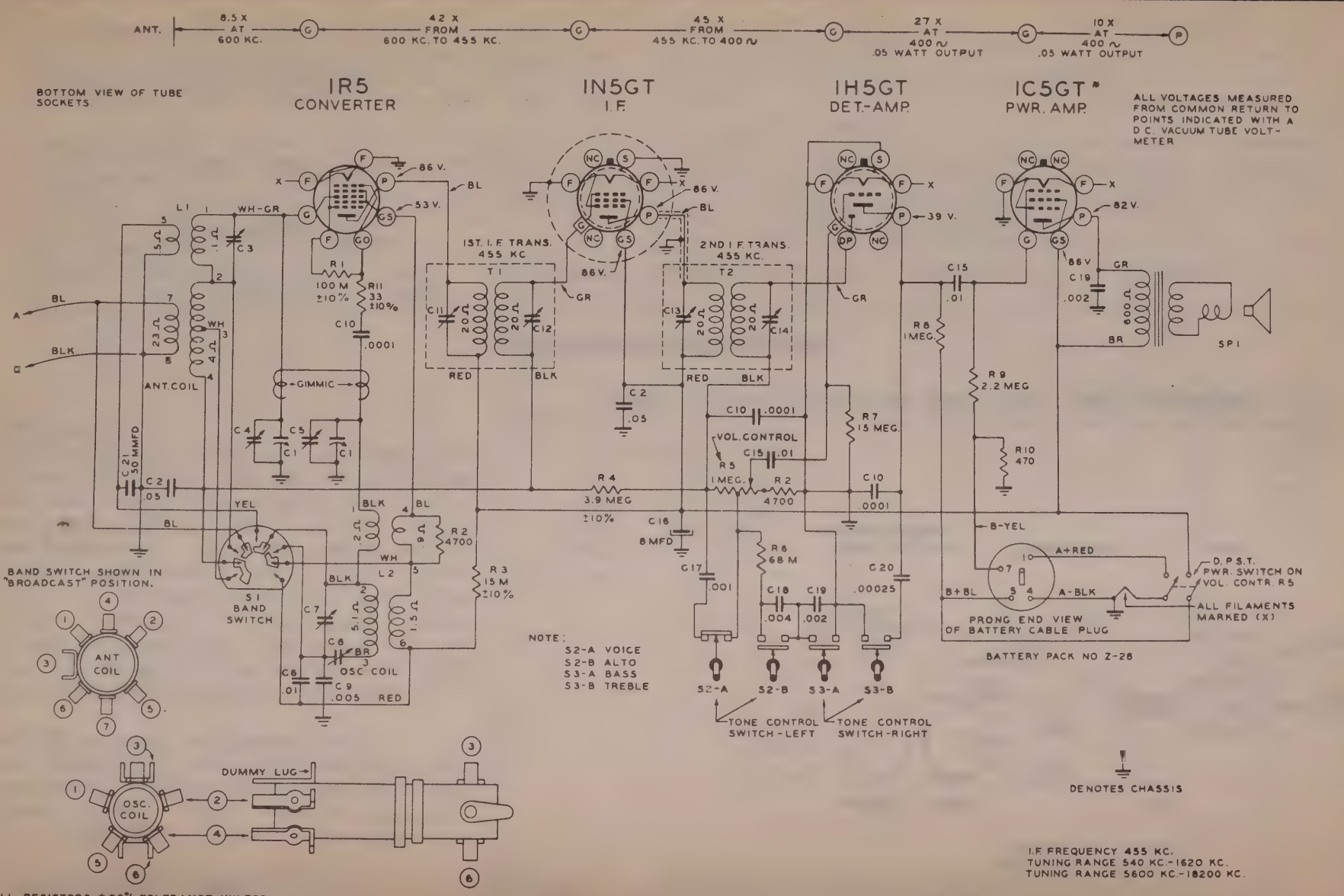

ANT.
8.5 X AT 600 KC.
42 X FROM 600 KC. TO 455 KC.
45 X FROM 455 KC. TO 400 ~
27 X AT 400 ~ .05 WATT OUTPUT
10 X AT 400 ~ .05 WATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS.
1R5 CONVERTER
1N5GT I.F.
1H5GT DET.-AMP.
1C5GT* PWR. AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLT-METER
1ST. I.F. TRANS. 455 KC.
2ND I.F. TRANS. 455 KC.
ANT. COIL
GIMMIC
VOL. CONTROL
BAND SWITCH SHOWN IN "BROADCAST" POSITION.
S1 BAND SWITCH
OSC. COIL
DUMMY LUG
NOTE:
S2-A VOICE
S2-B ALTO
S3-A BASS
S3-B TREBLE
TONE CONTROL SWITCH-LEFT
TONE CONTROL SWITCH-RIGHT
PRONG END VIEW OF BATTERY CABLE PLUG
BATTERY PACK NO Z-28
D.P.S.T. PWR. SWITCH ON VOL CONTR R5
ALL FILAMENTS MARKED (X)
DENOTES CHASSIS
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY 455 KC.
TUNING RANGE 540 KC.-1620 KC.
TUNING RANGE 5600 KC.-18200 KC.

MODELS 4K040-4K040G **CHASSIS** No. 4C54

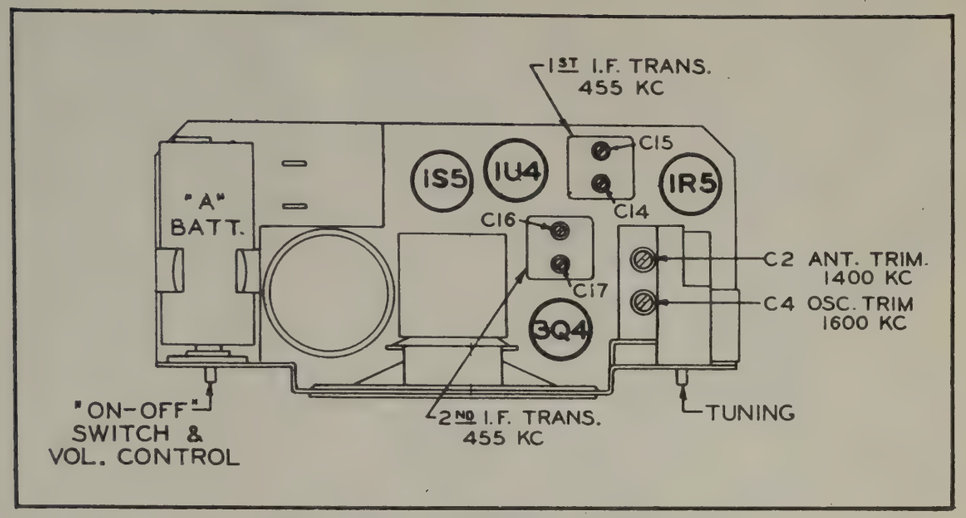
PART NO.	REF. NO.	DESCRIPTION	PRICE
		MISCELLANEOUS--Continued	
49-587	SP1	3-1/2" P. M. Speaker (Less Output Trans.)	4.25
		208-587 Cone and Voice Coil	1.65
54-254		Speed Nut (Tinnerman) (3 used on 83-1416)	.85C
57-1314		Cabinet Front Plate	3.00
57-1315		Chassis Bottom Plate	.50
78-274		Socket - Electrolytic Capacitor	.03
78-781		Socket - Miniature Tube (1 used)	.20
78-782		Socket - Miniature Tube (3 used)	.25
80-564		"B" Battery Retaining Spring	.06
80-567		Latch Spring	.02
80-611		Latch Spring	.03
83-895		"B" Battery Terminal Strip	.19
83-1416		Decorative Strip	.60
83-1417		Rubber Strip (Handle)	.10
83-1428		Wavemagnet Retainer Strip (2 used)	.03
85-400	S1	Power Change-over Switch	2.00
93-125		#6 Internal Shakeproof Lockwasher	.31C
93-197		.031 x .128 x 1/2" Steel Washer	1.30C
93-735		.012 x .093 x 4/64" Steel Washer - Cadmium	.20C
93-863		#5 Split Lockwasher - Steel - Cadmium (212-2)	.30C
93-892		#4 Countersunk Shakeproof Lockwasher	.02
95-1014	T3	Output Transformer	1.65
110-127		Grille Cloth	.15
112-56		#6 x 1/4" Hex Hd. Self Tapping Screw (9 used)	.55C
112-322		#2 x 3/16" Phillips Oval Hd. S. T. Screw (4 used on 24-436)	.03
112-683		#6 - 32 x 1/4" R. H. M. S. Steel Cadmium (Lockwasher attached) (2 used)	.02
112-684		#4 x 3/16" Binding Hd. S. T. Screw - Cad. Type 25 (4 used to hold bottom cover)	.01
112-685		#4 x 3/16" Flat Hd. S. T. Screw (2 used on S-13848) (2 used on S-13849)	.02
112-694		#5-40 x 1-1/4" Slotted Truss Hd. M. S. (212-2)	.01
114-58		#6-32 x 3/8" Hex. Acorn Hd. M. S. Steel N. P. (3 used) (Gang Mtg.)	.43C
125-17		Rubber Grommet	.03
125-58		Strain Relief Grommet	.15
125-59		Strain Relief Grommet	.15
126-539		Volume Control and Power Switch Shield	.15
199-79		Flexible Handle Sleeve	.30
202-527		Instruction Book	.10
212-2	SE1	Selenium Rectifier (or 212-4)	1.80
S-13775		Shield and Battery Retaining Spring Assembly	.35
S-13776		Wavemagnet Terminal Strip and Bracket Assembly (Pin Jack)	.15
S-13777		Power Switch Shield Assembly	.20
S-13786	L1	Wavemagnet Winding Assembly (Type 35)	.75
S-13788		Handle Strip and Rivet Assembly	.15
S-13789		Cover Hinge and Bracket Assembly (R.H.)	.20
S-13790		Cover Hinge and Bracket Assembly (L.H.)	.20
S-13848		Hinge and Wire Assembly (R. H.)	.50
S-13849		Hinge and Wire Assembly (L. H.)	.50
S-13850		Strip and "A" Battery Front Contact Assembly	.06
S-14482		Bottom Cover Latch Assembly	1.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CPC--25M--1-1-48



MODELS 4K040-4K040G **CHASSIS** No. 4C54



TUBE AND TRIMMER LOCATION

MODEL 4G800
CHASSIS No. 4E41

TO THE SERVICEMAN:

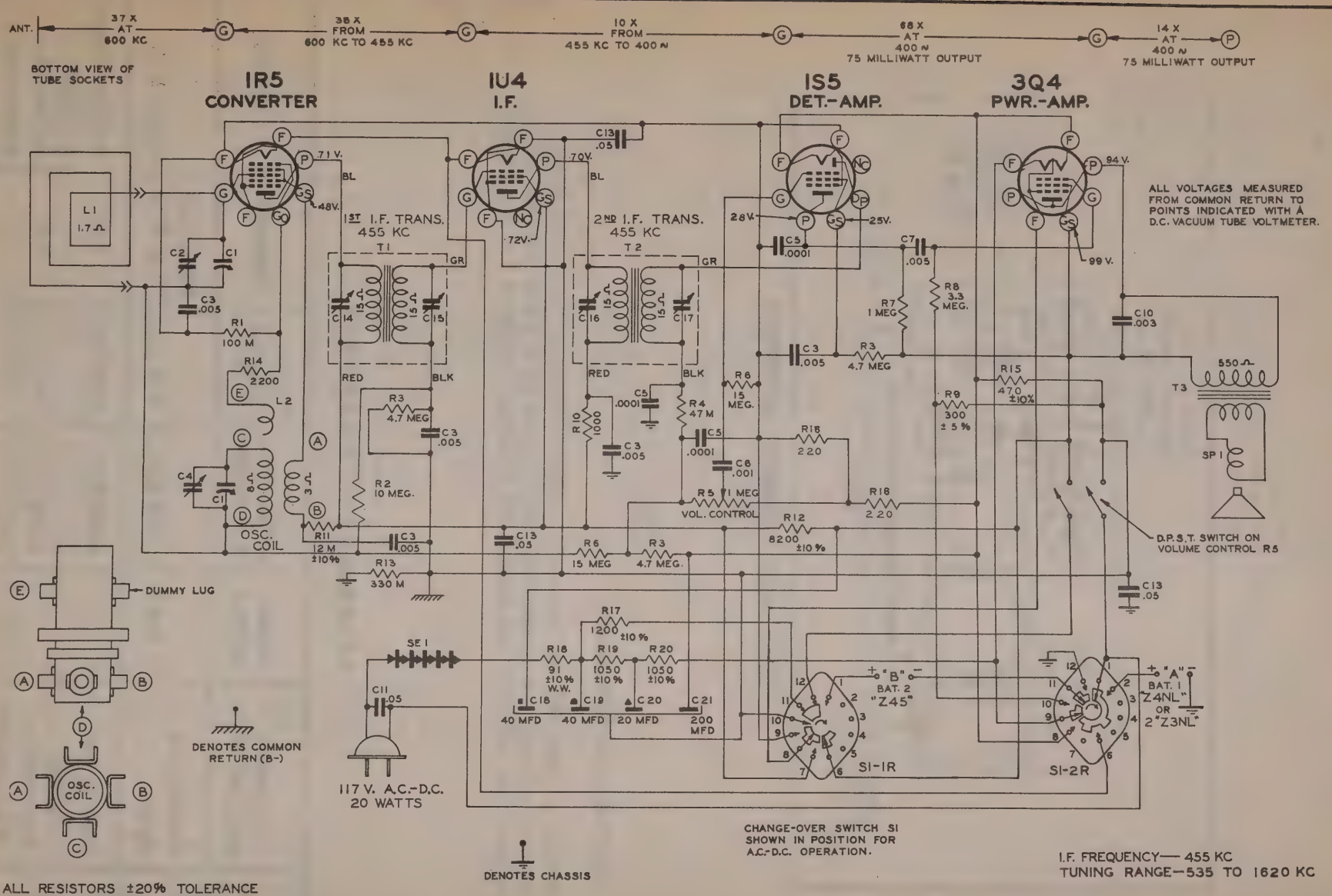
Final alignment of the 4E41 chassis should be made with the chassis installed in the cabinet. Tune in a weak station in the vicinity of 1400 KC and adjust the antenna trimmer for maximum.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.1 MFD	455 Kc.	600 Kc.	C14, C15, C16, C17	Align I.F.
2	One Turn Loosely Coupled to Wavemagnet		1600 Kc.	1600 Kc.	C4	Set Oscillator To Scale -- Adjust for Maximum.
3			1400 Kc.	1400 Kc.	C2	

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
12-1374		Volume Control Mounting Bracket	$ 0.08
46-683		Front Cover Latch Knob	.35
46-684		Tuning Control Knob	.06
46-685		Volume Control Knob	.10
59-200		Dial Pointer	.10
93-114		Brass Washer (Under Dial Pointer)	.03
94-295		Gang Capacitor Mounting Bushing	.04
		COILS AND CHOKES	
95-1015	T1	1st I. F. Transformer	2.50
95-1016	T2	2nd I. F. Transformer	2.50
S-13774	L2	Oscillator Coil Assembly	.55
		CONDENSERS	
22-326	C10	.003 MFD . . . . . 400 V.	.20
22-1175	C7	.005 MFD . . . . . 600 V.	.20
22-1443	C18, C19, C20, C21	Multiple Section Electrolytic 40-40-20 MFD. - 150 V. x 200 MFD. - 10 V	3.25
22-1457	C1	Two Section Variable	4.00
22-1655	C13	.05 MFD . . . . . 200 V.	.20
22-1660	C11	.05 MFD. (or 22-1756) . . . . . 400 V.	.20
22-1669	C5	.002 MFD. (Ceramic) . . . . . 500 V.	.20
22-1676	C6	.001 MFD. (Ceramic) (or 22-1343) . . 500 V.	.40
22-1706	C2	.008 MFD. (Ceramic) . . . . . 450 V.	.30
		RESISTORS	
63-1553	R5	Volume Control & Switch	1.81
63-1564	R18	91 Ohm, Insulated . . . . . 2 W.	.33
63-1647	R19, R20	Candohm.	.65
63-1762	R9	300 Ohm, Insulated . . . . . 1/2 W.	.21
63-1771	R15	470 Ohm . . . . . 1/2 W.	.10
63-1786	R10	1000 Ohm, Insulated. . . . . 1/2 W.	.21
63-1758	R16	220 Ohm . . . . . 1/2 W.	
63-1789	R17	1200 Ohm, Insulated. . . . . 1/2 W.	.21
63-1800	R14	2200 Ohm, Insulated. . . . . 1/2 W.	.21
63-1824	R12	8200 Ohm, Insulated. . . . . 1/2 W.	.21
63-1831	R11	12M Ohm, Insulated . . . . . 1/2 W.	.21
63-1856	R4	47M Ohm, Insulated . . . . . 1/2 W.	.21
63-1870	R1	100M Ohm, Insulated . . . . . 1/2 W.	.21
63-1891	R13	330M Ohm, Insulated . . . . . 1/2 W.	.21
63-1912	R7	1 Megohm, Insulated . . . . . 1/2 W.	.21
63-1933	R8	3.3 Megohm, Insulated . . . . . 1/2 W.	.21
63-1940	R3	4.7 Megohm, Insulated . . . . . 1/2 W.	.21
63-1954	R2	10 Megohm, Insulated . . . . . 1/2 W.	.21
63-1961	R6	15 Megohm, Insulated . . . . . 1/2 W.	.21
		MISCELLANEOUS	
11-102		Line Cord and Plug	.65
12-1379		Handle Support Bracket (R. H.)	.07
12-1380		Handle Support Bracket (L. H.)	.07
14-907		Model 800 Portable Cabinet - Plastic (Body Only)	2.00
14-907W		Model 800W Portable Cabinet - White Plastic (Body Only)	2.00
14-907Y		Model 800Y Portable Cabinet - Black Plastic (Body Only)	2.00
24-434		Cabinet Front Cover	1.10
24-436		Wavemagnet Cover	0.50
43-149		Handle End Piece (2 used)	1.25


ANT.
37 X AT 600 KC
38 X FROM 600 KC TO 455 KC
10 X FROM 455 KC TO 400 ~
68 X AT 400 ~ 75 MILLIWATT OUTPUT
14 X AT 400 ~ 75 MILLIWATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS
1R5 CONVERTER
1U4 I.F.
1S5 DET.-AMP.
3Q4 PWR.-AMP.
1ST I.F. TRANS. 455 KC
2ND I.F. TRANS. 455 KC
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.
OSC. COIL
DUMMY LUG
DENOTES COMMON RETURN (B-)
117 V. A.C.-D.C. 20 WATTS
DENOTES CHASSIS
CHANGE-OVER SWITCH S1 SHOWN IN POSITION FOR A.C.-D.C. OPERATION.
D.P.S.T. SWITCH ON VOLUME CONTROL R5
"B" BAT. 2 "Z45"
"A" BAT. 1 "Z4NL" OR 2 "Z3NL"
S1-1R
S1-2R
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY— 455 KC
TUNING RANGE—535 TO 1620 KC

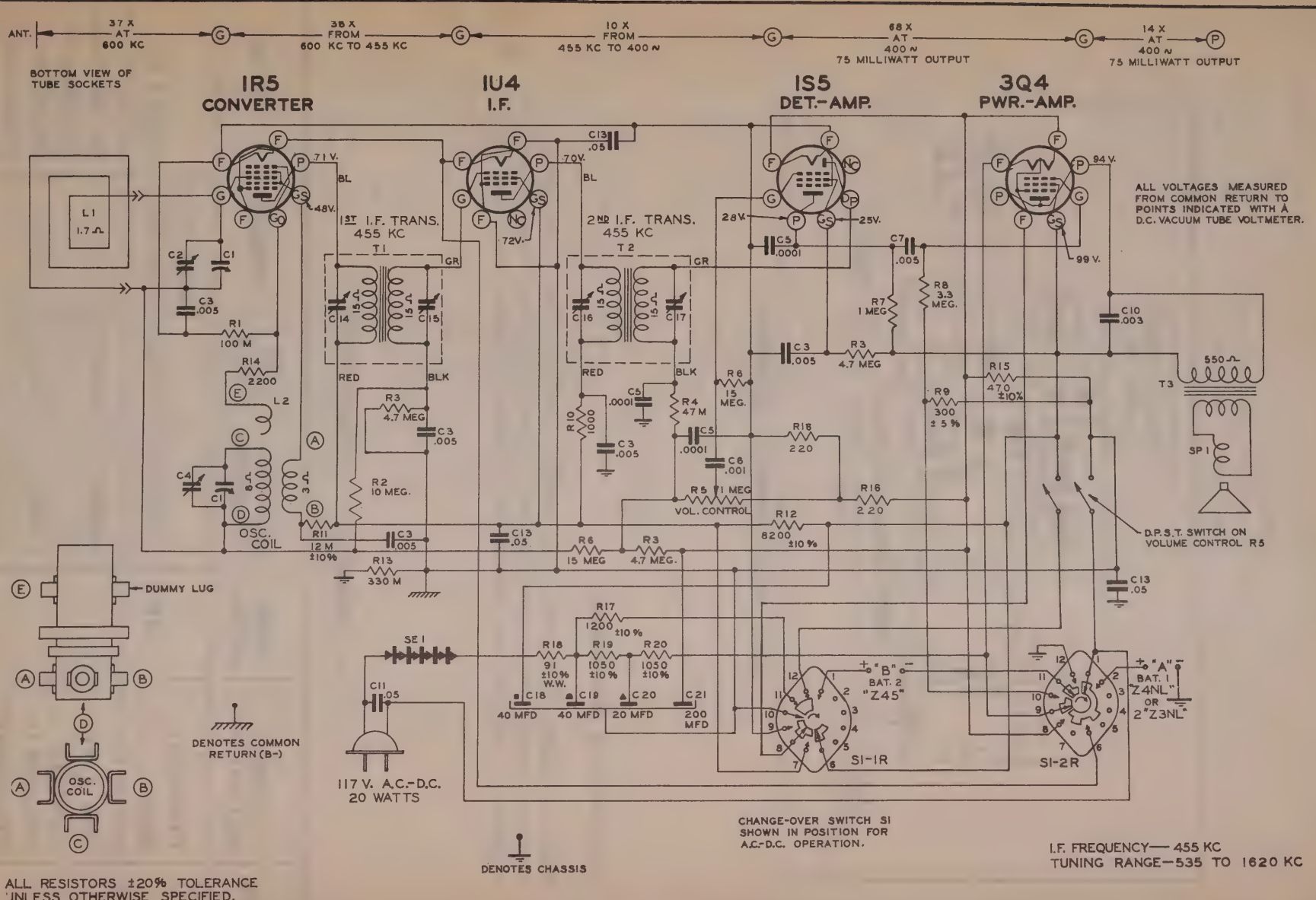
MODEL 4G800

CHASSIS No. 4E41

PART NO.	REF. NO.	DESCRIPTION	PRICE
		MISCELLANEOUS--Continued	
24-436Y		Wavemagnet Cover (YZ Only)	.50
24-462		Switch Cover	.08
24-465		Wavemagnet Cover (WZ Only)	1.00
43-149		Handle End Piece (2 Used)	1.25
49-587	SP1	3-1/2" P. M. Speaker (Less Output Trans.)	4.25
		208-587 Cone and Voice Coil	1.65
54-254		Speed Nut (Tinnerman) (3 Used on 83-1416)	.85C
57-1314		Cabinet Front Plate	3.00
57-1315		Chassis Bottom Plate	.50
78-274		Socket - Electrolytic Capacitor	.03
78-781		Socket - Miniature Tube (1 used)	.20
78-782		Socket - Miniature Tube (3 used)	.25
80-564		"B" Battery Retaining Spring	.06
80-567		Latch Spring	.02
80-611		Latch Spring	.03
83-1416		Decorative Strip	.60
83-1417		Rubber Strip (Handle)	.10
83-1428		Wavemagnet Retainer Strip (2 used)	.03
83-1513		"B" Battery Terminal Strip and Wire	.25
85-400	S1	Power Change-over Switch	2.00
85-433	S2	"On-Off" Switch (D. P. S. T.)	1.20
93-125		#6 International Shakeproof Lockwasher	.31C
93-197		.031 x .128 x 1/2" Steel Washer	1.30C
93-735		.012 x .093 x 4/64" Steel Washer - Cadmium	.20C
93-863		#5 Split Lockwasher - Steel - Cadmium (212-2)	.30C
93-892		#4 Countersunk Shakeproof Lockwasher	.02
95-1014	T3	Output Transformer	1.65
110-127		Grille Cloth	.15
112-56		#6 x 1/4" Hex Hd. Self Tapping Screw (9 used)	.55C
112-322		#2 x 3/16" Phillips Oval Hd. S. T. Screw (4 used on 24-436)	.03
112-407		#6 x 3/8" Rd. Hd. Self Tapping Screw - Cadmium (4 Used)	.02
112-536		#6 x 5/16" Phillips Binding Hd. Self Tapping Screw - Cadmium	1.80C
112-683		#6 - 32 x 1/4" R. H. M. S. Steel Cadmium (Lockwasher attached) (2 used)	.02
112-685		#4 x 3/16" Flat Hd. S. T. Screw (2 used on S-13848) (2 used on S-13849)	.02
112-694		#5-40 x 1-1/4" Slotted Truss Hd. M. S. (212-2)	.01
112-711		#4 x 1/4" Binding Hd. Self Tapping Screw - Stat. Bronze (8 used)	1.20C
112-713		#4-40 x 1/4" Rd. Phillips Hd. M. Screw (Int. Lockwasher attached)	.02
114-58		#6-32 x 3/8" Hex. Acorn Hd. M. S. Steel N. P. (3 used) (Gang Mtg.)	.43C
125-17		Rubber Grommet	.03
125-58		Strain Relief Grommet	.15
125-59		Strain Relief Grommet	.15
126-539		Volume Control and Power Switch Shield	.15
199-79		Flexible Handle Sleeve .....(Z)	.30
199-79Y		Flexible Handle Sleeve .....(WZ and YZ)	.30
202-613		Instruction Book	.11
212-2	SE1	Selenium Rectifier (or 212-4)	1.80
S-13775		Shield and Battery Retaining Spring Assembly	.35
S-13777		Power Switch Shield Assembly	.20
S-13786	L1	Wavemagnet Winding Assembly (Type 35)	.75
S-13789		Cover Hinge and Bracket Assembly (R.H.)	.20
S-13790		Cover Hinge and Bracket Assembly (L.H.)	.20
S-13848		Hinge and Wire Assembly (R.H.)	.50
S-13849		Hinge and Wire Assembly (L.H.)	.50
S-13850		Strip and "A" Battery Front Contact Assembly	.06
S-14482		Bottom Cover Latch Assembly	1.50
S-14622		Wavemagnet Terminal Strip & Bracket Assembly (Pin Jack)	.04
S-14755		Handle Strip Assembly	.05

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CPC--25M--4-48

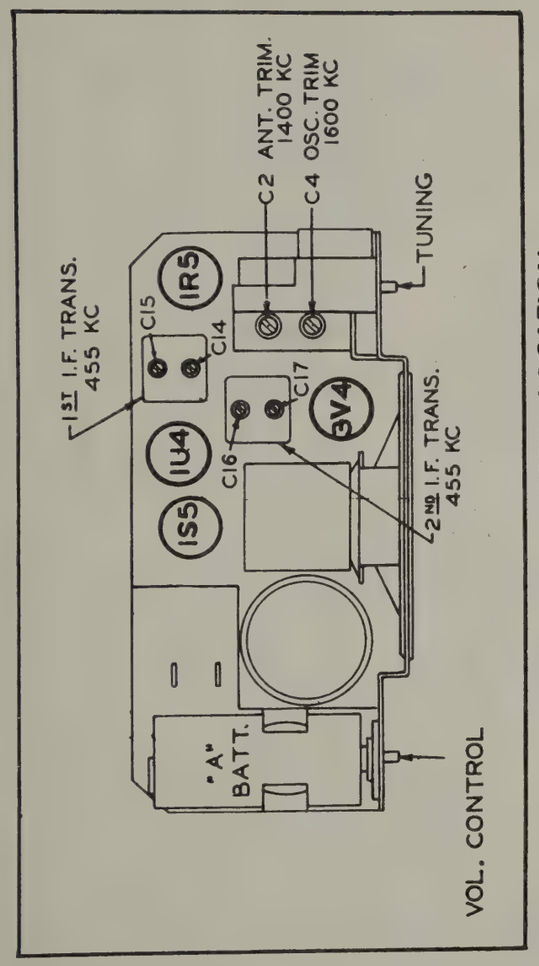

ANT.
37 X AT 600 KC
38 X FROM 600 KC TO 455 KC
10 X FROM 455 KC TO 400 ~
68 X AT 400 ~ 75 MILLIWATT OUTPUT
14 X AT 400 ~ 75 MILLIWATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS
1R5 CONVERTER
1U4 I.F.
1S5 DET.-AMP.
3Q4 PWR.-AMP.
1ST I.F. TRANS. 455 KC
2ND I.F. TRANS. 455 KC
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.
OSC. COIL
DUMMY LUG
DENOTES COMMON RETURN (B-)
DENOTES CHASSIS
D.P.S.T. SWITCH ON VOLUME CONTROL R5
117 V. A.C.-D.C. 20 WATTS
CHANGE-OVER SWITCH S1 SHOWN IN POSITION FOR A.C.-D.C. OPERATION.
S1-1R
S1-2R
BAT. 2 "Z45"
BAT. 1 "Z4NL" OR 2 "Z3NL"
I.F. FREQUENCY— 455 KC
TUNING RANGE—535 TO 1620 KC
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

MODEL 4G800

CHASSIS No. 4E41

MODELS 4G800Z—4G800WZ—4G800YZ

CHASSIS No. 4E41Z



TUBE AND TRIMMER LOCATION

TO THE SERVICEMAN:

Final alignment of the 4E41Z chassis should be made with the chassis installed in the cabinet. Tune in a weak station in the vicinity of 1400 KC and adjust the antenna trimmer for maximum.

ALIGNMENT PROCEDURE

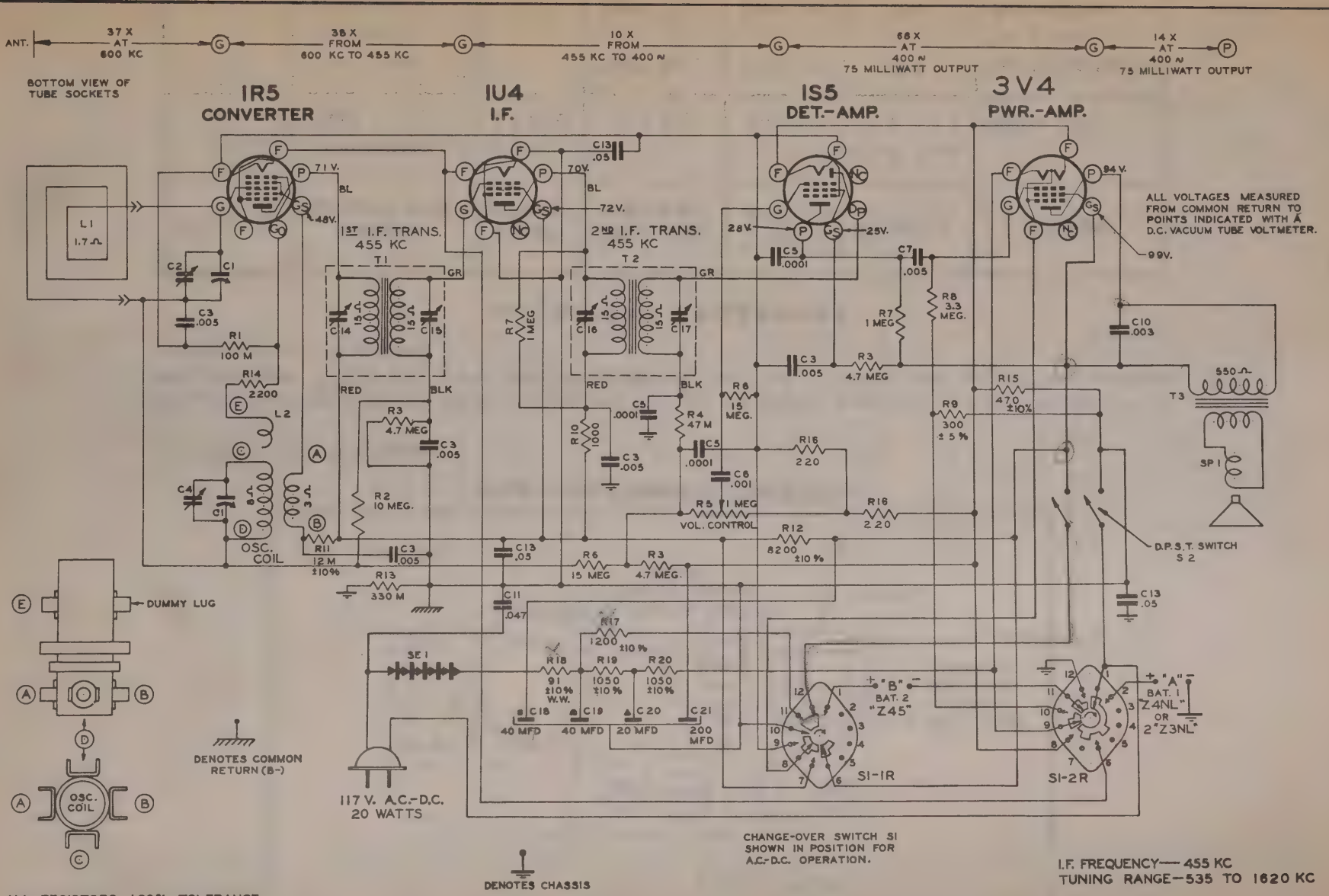
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.1 MFD	455 Kc.	600 Kc.	C14, C15, C16, C17	Align I.F.
2	One Turn Loosely Coupled to Wavemagnet		1600 Kc.	1600 Kc.	C4	Set Oscillator To Scale -- Adjust for Maximum.
3			1400 Kc.	1400 Kc.	C2	

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
12-1374		Volume Control Mounting Bracket	$0.08
46-683		Front Cover Latch Knob	.35
46-684		Tuning Control Knob	.06
46-684Y		Tuning Control Knob (For WZ & YZ)	.06
46-736		On-Off Switch Knob (Z)	.05
46-736W		On-Off Switch Knob (WZ Only)	.05
46-736Y		On-Off Switch Knob (YZ Only)	.05
46-737		Volume Control Knob (Used in WZ & YZ)	.10
46-737Y		Volume Control Knob (Used in WZ & YZ	.10
59-200		Dial Pointer	.10
93-114		Brass Washer (Under Dial Pointer)	.03
94-295		Gang Capacitor Mounting Bushing	.04
		COILS AND CHOKES	
95-1015	T1	1st I. F. Transformer	2.50
95-1016	T2	2nd I. F. Transformer	2.50
S-13774	L2	Oscillator Coil Assembly	.55
		CONDENSERS	
22-326	C10	.003 MFD. . . . . 400 V.	.20
22-1175*	C7	.005 MFD. . . . . 600 V.	.20
22-1443	C18, C19, C20, C21	Multiple Section Electrolytic 40-40-20 MFD. - 150 V. x 200 MFD. - 10V	3.25
22-1457	C1	Two Section Variable	4.00
22-1655	C13	.05 MFD . . . . . 200 V.	.20
22-1669	C5	.0001 MFD. (Ceramic). . . 500 V.	.20
22-1676*	C6	.001 MFD. (Ceramic) . . . 500 V (or 22-1343)	.40
22-1706*	C3	.008 MFD. (Ceramic) . . . 500 V.	.30
22-1775*	C11	.047 MFD. . . . . 400 V.	.26
		RESISTORS	
63-1564	R18	91 Ohm, Insulated . . . . . 2 W	.33
63-1647	R19, R20	Candohm	.65
63-1651	R5	Volume Control	1.20
63-1655	R18	91 Ohm W. W. . . . . 2 W	.19
63-1758	R16	220 Ohm, Insulated . . . . 1/2 W	.21
63-1762	R9	300 Ohm, Insulated . . . . 1/2 W	.21
63-1771	R15	470 Ohm . . . . . 1/2 W	.10
63-1786	R10	1000 Ohm, Insulated. . . . 1/2 W	.21
63-1758	R16	220 Ohm . . . . . 1/2 W	.21
63-1789	R17	1200 Ohm, Insulated. . . . 1/2 W	.21
63-1800	R14	2200 Ohm, Insulated. . . . 1/2 W	.21
63-1824	R12	8200 Ohm, Insulated. . . . 1/2 W	.21
63-1831	R11	12M Ohm, Insulated . . . . 1/2 W	.21
63-1856*	R4	47 M Ohm, Insulated . . . 1/2 W	.21
63-1870	R1	100M Ohm, Insulated . . . 1/2 W	.21
63-1891	R13	330M Ohm, Insulated . . . 1/2 W	.21
63-1912	R7	1 Megohm, Insulated . . . 1/2 W	.21
63-1933	R8	3.3 Megohm, Insulated . . 1/2 W	.21
63-1940	R3	4.7 Megohm, Insulated . . 1/2 W	.21
63-1954	R2	10 Megohm, Insulated . . . 1/2 W	.21
63-1961	R6	15 Megohm, Insulated . . . 1/2 W	.21
		MISCELLANEOUS	
11-102		Line Cord and Plug	.65
12-1379		Handle Support Bracket (R. H.)	.07
12-1380		Handle Support Bracket (L. H.)	.07
14-907		Model 800 Portable Cabinet - Plastic (Body Only)(Z)	2.00
14-907W		Model 800W Portable Cabinet - White Plastic (Body Only) (WZ Only)	2.00
14-907Y		Model 800Y Portable Cabinet - Black Plastic (Body Only) (YZ Only)	2.00
24-434		Cabinet Front Cover. . . . (Z)	1.10
24-434W		Cabinet Cover (WZ Only)	1.10
24-434Y		Cabinet Cover (YZ Only)	1.10
24-436		Wavemagnet Cover. . . . . (Z)	0.50

*Some 4E41Z chassis have the 4 capacitors, which are part of the 1S5 detector amplifier circuit, combined into a single unit Zenith part number 105-3. These capacitors are C5 and C7 (pin 5), C3 (pin 4) and C6 (pin 6) on the 1S5 tube.

The 105-2 unit combines the diode filter unit R4 and the two capacitors C5. This unit connects to the secondary (black lead) of the 2nd IF transformer.


ANT.
37 X AT 600 KC
38 X FROM 600 KC TO 455 KC
10 X FROM 455 KC TO 400 ~
68 X AT 400 ~ 75 MILLIWATT OUTPUT
14 X AT 400 ~ 75 MILLIWATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS
1R5 CONVERTER
1U4 I.F.
1S5 DET.-AMP.
3V4 PWR.-AMP.
1ST I.F. TRANS. 455 KC
2ND I.F. TRANS. 455 KC
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.
L1 1.7 Ω
T1
T2
T3
550 Ω
SP 1
OSC. COIL
DUMMY LUG
D.P.S.T. SWITCH S 2
VOL. CONTROL
SE 1
S1-1R
S1-2R
BAT. 2 "Z45"
BAT. 1 "Z4NL" OR 2 "Z3NL"
117 V. A.C.-D.C. 20 WATTS
DENOTES COMMON RETURN (B-)
DENOTES CHASSIS
CHANGE-OVER SWITCH S1 SHOWN IN POSITION FOR A.C.-D.C. OPERATION.
I.F. FREQUENCY— 455 KC
TUNING RANGE—535 TO 1620 KC
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

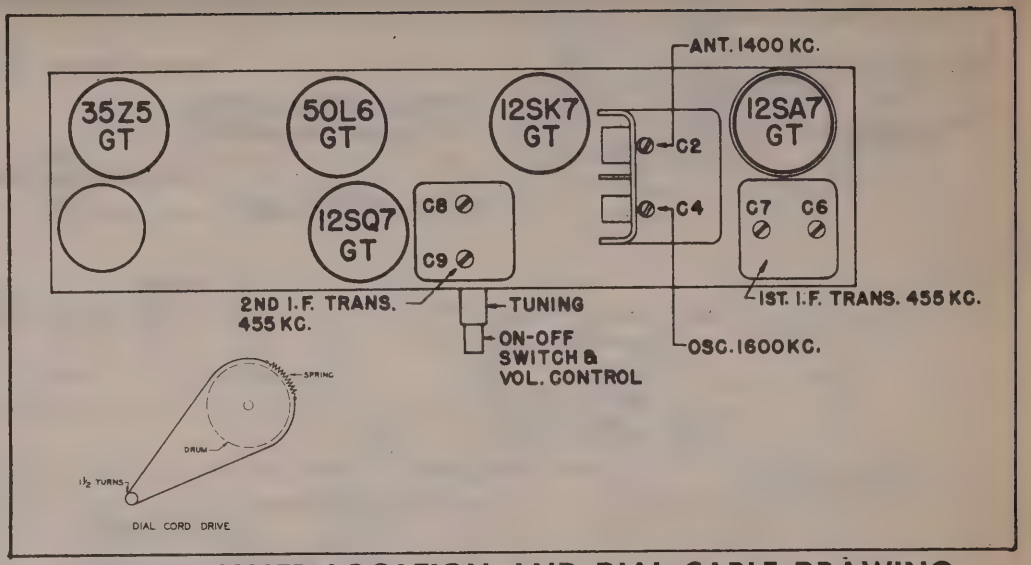
MODELS 4G800Z—4G800WZ—4G800YZ

CHASSIS No. 4E41Z

PARTS LIST

PART NO.	DIAL ASSEMBLY			PRICE
26-331	Dial Scale			.60
26-364	Dial Scale (Z Models only)			.58
59-153	Dial Pointer			1.00
76-407	Tuning Control Shaft			.15
78-325	Dial Light Socket and Wire			.24
80-365	Tuning Shaft Tension Spring			.03
80-470	Dial Cord Tension Spring			.03
100-67	Dial Light Bulb			.10
188-53	Tuning Shaft Retaining Ring			.01
199-66	Dial Light Sleeve			.02
11S11137	Dial Cord and Eyelet Assem.			.09
61S11098	Pulley and Bushing Assem.			.33
	COILS AND CHOKES			
95-905	1st. I. F. Transformer (T1)			1.90
95-906	2nd. I. F. Transformer (T2)			1.75
20S11136	Oscillator Coil Assem. (L2)			.58
20S12491	Oscillator Coil Assem. (Z Models only)			.62
	CONDENSERS			
22-196	.01 Mfd. (C19)	600 V.		.20
22-243	.01 Mfd. (C14)	400 V.		.20
22-492	.002 Mfd. (C11)	600 V.		.20
22-829	.05 Mfd. (C3)	200 V.		.20
22-854	.0005 Mfd. (C13)	600 V.		.20
22-953	.0002 Mfd. (C10)	600 V.		.16
22-1017	.05 Mfd. (C5)	200 V.		.20
22-1049	.03 Mfd. (C15)	400 V.		.20
22-1202	.04 Mfd. (C12)	200 V.		.20
22-1356	Two Gang Variable (C1)			3.40
22-1519 or 22-1551	Dry Electrolytic 40 - 20 - 20 - Mfd. - 150 V.			1.55
22-1525	Two Gang Variable (Z Models only)			3.40
	RESISTORS			
63-579	220 Ohm (R8)	1/4 Watt		.09
63-589	10M Ohm (R1)	1/4 Watt		.09
63-597	470M Ohm (R6)	1/4 Watt		.09
63-600	2.2 Megohm (R3)	1/4 Watt		.09
63-641	10M Ohm (R5)	1/4 Watt		.09
63-686	150 Ohm W.W. (R7)	1/2 Watt	Insl.	.21
63-976	15 Megohm (R2)	1/4 Watt		.09
63-1022	150 Ohm W.W. (R7) Replaces 63-686.	1 Watt	...Insl.	.24
63-1222	470 Ohm W.W. (R11)	1 Watt	...Insl. 10%...	.24
63-1337	Volume Control and Sw. (R4)			1.81
63-1449	470 Ohm W.W. (R9)	1 Watt	...Insl.	.24
63-1450	22 Ohm W.W. (R10)	1 Watt	...Insl.	.24
	MISCELLANEOUS			
2-101	Cabinet Back (5D011 and 5D011Y)			.11
2-101W	Cabinet Back (5D011W)			.13
2-102	Cabinet Back (5D027)			.10
11-79	Line Cord and Plug			.65
14-911	Model 011 Bakelite Cabinet (Walnut)			4.50
14-911W	Model 011W Bakelite Cabinet (White)			6.65
14-911Y	Model 011Y Bakelite Cabinet (Ebony)			6.65
27-68	Indicator Disc.			.01
46-529	Tuning Control Knob			.07
46-530	Volume Control Knob			.07
49-547	4" P. M. Speaker			7.00
	206-547 Output Trans.			1.67
	208-547 Cone and Voice Coil			1.73
78-229	Socket - Electrolytic Cond.			.03
78-373	Socket - Octal (5 Contact)			.12
78-376	Socket - Octal (8 Contact)			.12
78-611	Socket - Octal (8 Contact)			.12
112-273	# 8 x 3/4" O.B.H. - S.M. Screw (Stat. Bronze)			.96C
112-404	# 8 x 5/16" Phillips B.H. - S.T. Screw (Spk. Baffle Mtg.)..			.03
114-134	# 8 x 1 1/16" Hex Washer Hd. S.T. Screw (5D027)			1.20C
139-56	Speaker Baffle (5D011)			.07
159-42	Plug Button (Back Mtg.)			.02
159-50	Plug Button (Dial Crystal Mtg.)			.01
159-51	Plug Button (Spk. Baffle Mtg.)			.01
192-84	Dial Crystal (5D011)			.37
192-85	Dial Crystal (5D027)			.37
196-61	Dial Crystal Gasket (5D027)			.06
202-368	Instruction Book			.04
S11099	Wavemagnet Assem. (Type #26)			1.08
S12486	Wavemagnet Assem. (Type #28C) (Z Models only)			1.06
S12546	Grill Cloth and Spk. Grille Assem. (5D011)			.56

PRICES SUBJECT TO CHANGE WITHOUT NOTICE 15M 2-22-47



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

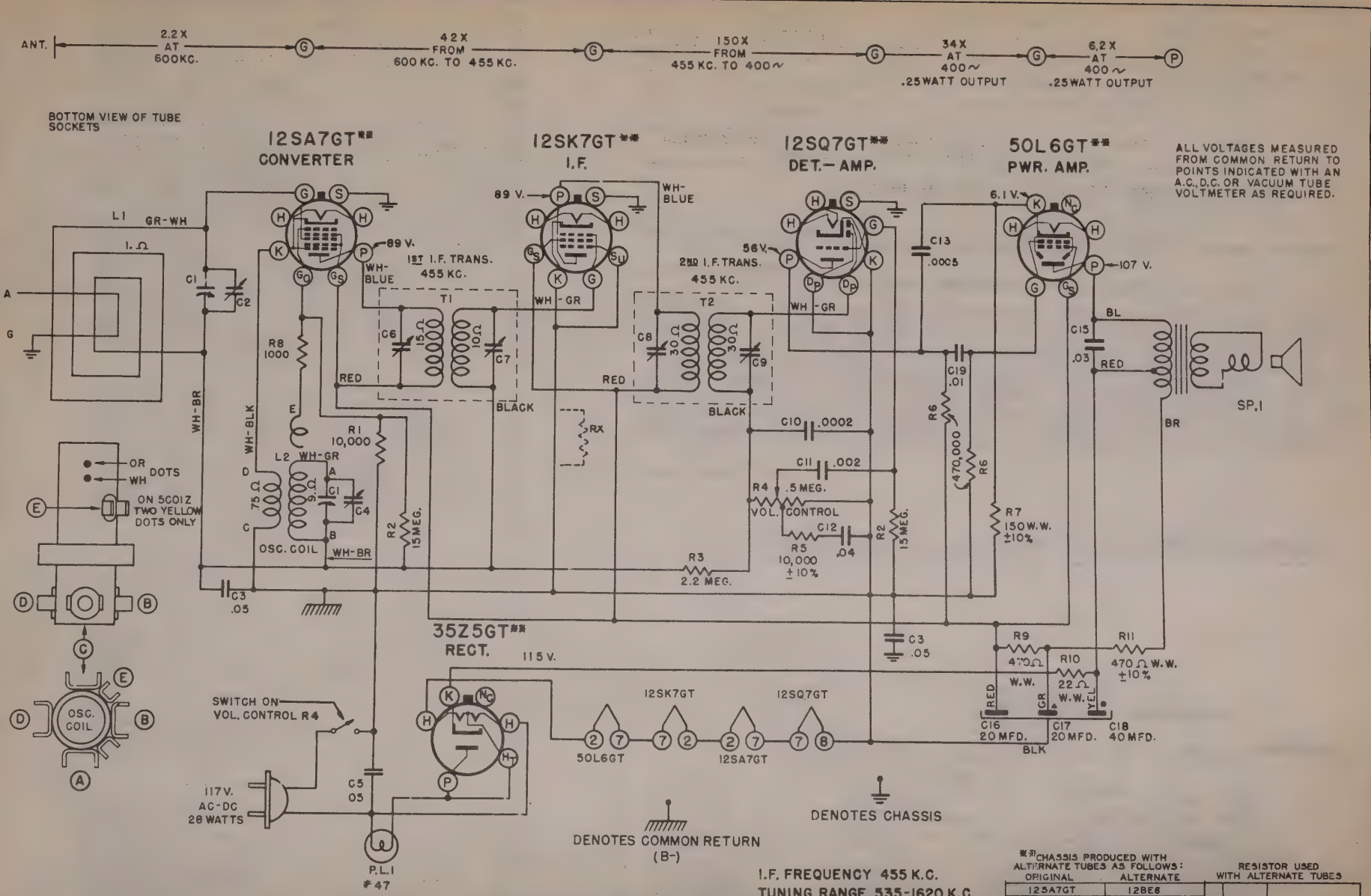
The filter circuits of chassis 5C01 incorporate new features that should be well understood by the service man. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter resistor R10 and capacitor C18 off the cathode of the rectifier 35Z5 to the 50L6 plate. The lower connection of the output transformer feeds B + to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 50L6 produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistor R9 and 11 and capacitors C16 and 17. Capacitor C15 across the primary of the output transformer by passes high frequencies back to ground.

This development in filtering systems allows a higher effective plate voltage on the 50L6 for increased power output.

NOTE: The output transformer must be replaced with an exact duplicate Part No. 202-549. Be sure to add the speaker code letter to the transformer Part Number.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-6, C-7, C-8, C-9	Align I. F.
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage



****CHASSIS PRODUCED WITH ALTERNATE TUBES AS FOLLOWS:**

ORIGINAL	ALTERNATE
12SA7GT	12BE6
12SA7GT	14Q7
35Z5GT	35W4
12SK7	12BA6
12SQ7GT	12AT6 ***
50L6GT	50B5

RESISTOR USED WITH ALTERNATE TUBES

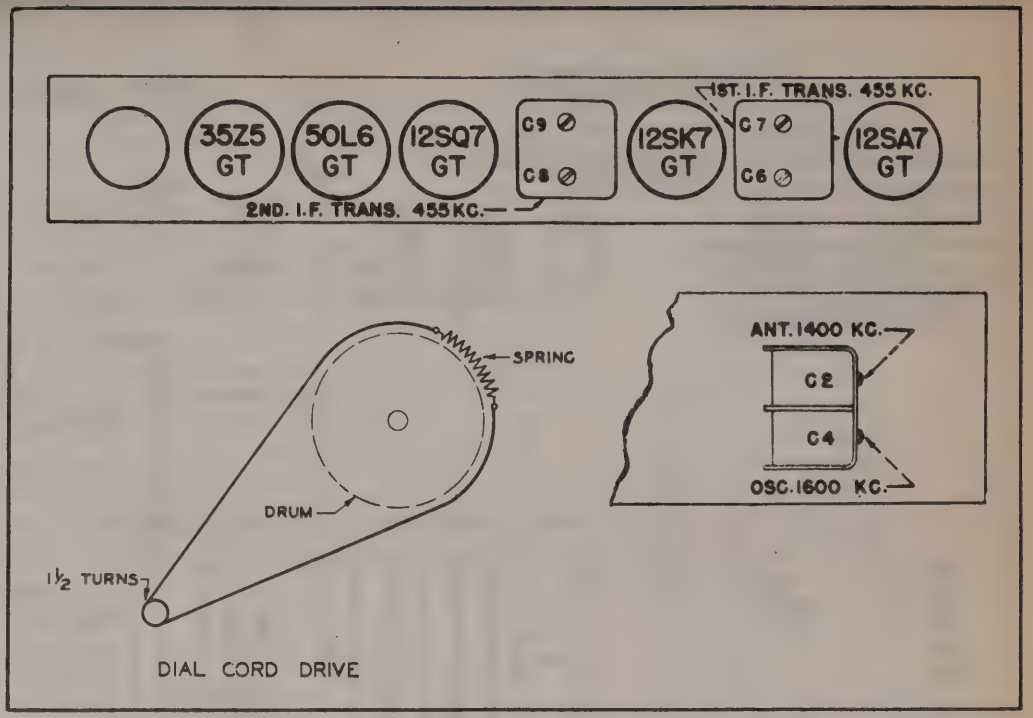
RX	63-577	100 OHM 1/4 W.

MODELS 5D011—5D027—5D011Z—5D027Z

PARTS LIST

PART NO.	DESCRIPTION	PRICE
	DIAL ASSEMBLY	
26-354	Dial Scale	.28
26-367	Dial Scale (Z Models only)	.28
59-164	Dial Pointer	.19
76-416	Tuning Control Shaft	.16
78-325	Dial Light Socket and Wire	.24
80-365	Tuning Shaft Friction Spring	.03
80-470	Dial Cord Tension Spring	.03
100-67	Dial Light Bulb (P. L. 1)	.10
188-30	Retaining Ring	1.20C
11S11281	Dial Cord and Eyelet Assem.	.05
61S11098	Drive Pulley and Bushing Assem.	.24
	COILS AND CHOKES	
95-908	2nd. I. F. Transformer (T2)	1.75
95-919	1st. I. F. Transformer (T1)	1.80
20S11284	Oscillator Coil Assem. (L2)	.62
20S12652	Oscillator Coil Assem. (Z Models only) (L2)	.78
	CONDENSERS	
22-196	.01 Mfd. (C15) ..... 600 V.	.20
22-669	.01 Mfd. (C11) ..... 600 V.	.20
22-826	.01 Mfd. (C12) ..... 200 V.	.20
22-829	.05 Mfd. (C3) ..... 200 V.	.20
22-854	.0005 Mfd. (C14) ... 600 V.	.20
22-953	.0002 Mfd. (C10) ... 600 V.	.16
22-1017	.05 Mfd. (C5)..... 200 V.	.20
22-1356	Two Gang Variable (5C04)	
22-1379	.02 Mfd. (C16) ..... 400 V.	.20
22-1381 or 22-1552	Dry Electrolytic 40 - 40 - 40 Mfd. - 150 V. (C17, C18, C19)	1.71
22-1419	Two Gang Variable (C1)	3.45
22-1527	Two Gang Variable (Z Models only)	3.45
	RESISTORS	
63-583	1000 Ohm (C1) ..... 1/4 Watt	.09
63-589	10M Ohm (R2)..... 1/4 Watt	.09
63-597	470M Ohm (R7)..... 1/4 Watt	.09
63-600	2.2 Megohm (R4) .... 1/4 Watt	.09
63-602	4.7 Megohm (R12).... 1/4 Watt	.09
63-644	22M Ohm (R6) ..... 1/4 Watt	.09
63-686	150 Ohm W. W. (R8) 1/2 Watt ... Insl.	.21
63-976	15 Megohm (R3) ..... 1/4 Watt	.09
63-1219	22 Ohm ...W. W. (R9) 1/2 Watt ....Insl.	.21
63-1220	100 Ohm ..W. W.(R10) 1 Watt .....Insl.	.24
63-1221	680 Ohm ..W. W.(R11) 1 Watt .....Insl.	.24
63-1348	Volume Control and Sw. (R5)	1.81
	MISCELLANEOUS	
11-87	Line Cord and Plug	.65
15-62	Phono Socket Cap	.22
46-538	Tuning Control Knob	.10
46-548	Radio - Phono - Reject Sw. Knob (Release Button)	.07
49-518	5" P.M. Speaker	7.75
	206-518 Output Trans.	1.97
	208-518 Cone and Voice Coil	1.73
	AC Receptacle (P3 - Used on 5C04 Only)	
57-1140	Escutcheon Plate	.90
78-229	Socket - Electrolytic Cond.	.03
78-555	Socket - Phono (6 Contact)	.11
78-611	Socket - Tube (Octal - 8 Contact)	.12
85-337	Phono - Radio Sw. (S1)	.72
85-338	Record Reject Sw. (S2 - 5C02 and 5C02Z)	.60
114-128	Chassis Mtg. Screw	1.81C
188-54	Clamping Ring (Tuning Knob)	.02
192-101	Dial Crystal	.48
196-87	Dial Crystal Gasket	.04
202-377	Instruction Book	.05
46S11558	Volume Con. Knob and Ring Assem. (46-520)	.28
52S11283	Phono Cable and Socket Assem. (P1 - 5C02 and 5C02Z)	1.07
S11287	Phono Cable (Used on 5C04 Only)	
S11296	Wavemagnet Assem. (Type 28A) (L1)	1.32
S12677	Wavemagnet Assem. (Type 28D) (Models Z only) (L1)	1.16
	RECORD CHANGER MTG. PARTS	
19-123	Record Changer Mtg. Clip	.10
80-407	Record Changer Mtg. Spring	.02
112-420	Record Changer Mtg. Screw	.33
202-381	Phono Instruction Sheet	.10
S11468	Non - Intermixer Record Changer	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE 15M 2-22-47



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 5C02 and 5C04 chassis are identical electrically. Chassis 5C02 has a Record Reject push button switch on the receiver control panel to reject records.

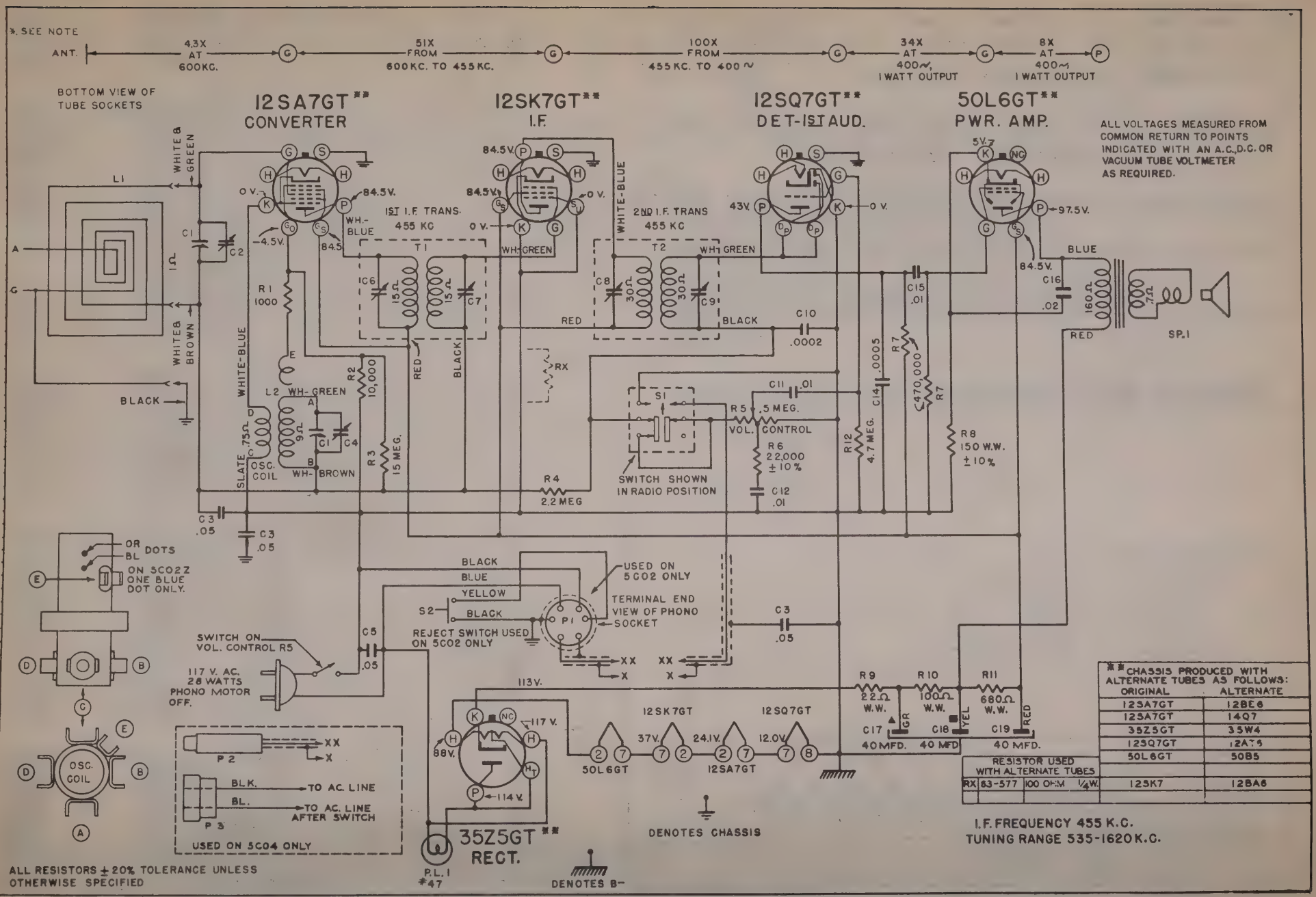
The socket P1 is used to connect the automatic record changer to the receiver.

The Phono-Radio switch is a two position double acting push-button switch and when in the "in" position connects the changer for playing records.

Chassis 5C04 has the same Phono-Radio switch arrangement. However, the 5C04 does not have socket P1 and the Record Reject switch. The record player is connected to the receiver by a shielded cable and socket arrangement.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd.	455 Kc.	1600 Kc.	C-6, C-7, C-8, C-9	Align I. F.
2	Single Turn Loop Loosely Coupled to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna.



** CHASSIS PRODUCED WITH ALTERNATE TUBES AS FOLLOWS:

ORIGINAL	ALTERNATE
12SA7GT	12BE6
12SA7GT	14Q7
35Z5GT	35W4
12SQ7GT	12AT6
50L6GT	50B5
12SK7	12BA6

RESISTOR USED WITH ALTERNATE TUBES

RX	83-577	100 OHM	1/4W.

PARTS LIST

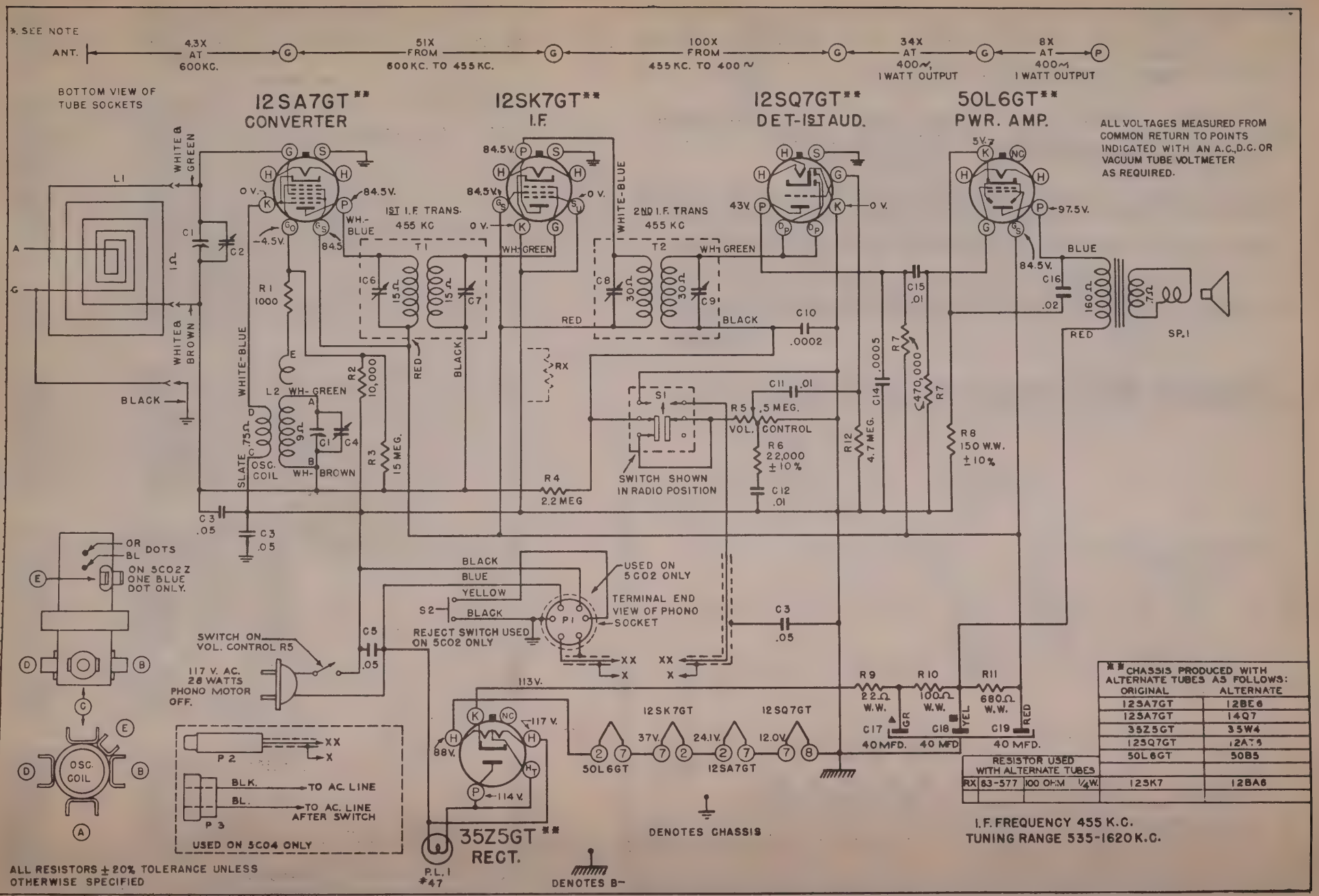
63-654	180M Ohm $\frac{1}{4}$ Watt (R1)	.09
63-976	15 Megohm $\frac{1}{4}$ Watt (R7)	.09
63-1097	870 Ohm W. W. Insl. 1 Watt (R9)	.24
63-1099	33 Ohm W. W. Insl. $\frac{1}{2}$ Watt (R14)	.21
63-1363	Two Section Candohm (63-1132) (R11-R12)	.60
63-1366	Zipohn (R10)	.24
63-1549	Vol. Control & Switch D P S T (R6)	1.81

MISCELLANEOUS

11-70	A. C. Line Cord & Plug (Alt 11-90)	.60
12-1322	Reinforcing Brkt. (2 used Handle)	.15
14-903	Polystyrene Cabinet Front Less Accessories (use S-13209)	...
15-51	Battery Socket Cap	.09
24-371	Cabinet Rear Cover Less Accessories (Use S-11999)	...
40-28	Cabinet Hinge	.20
43-111	Handle End Pieces (Die Cast)	.65
49-540	4" P M Speaker	7.25
	206-540 Output Transformer	1.67
	208-540 Cone & Voice Coil Assem.	1.73
54-224	Speed Nut (2 used S-11999)	.017
57-1119	Chassis Bottom Plate	.24
64-98	Brass Eyelet (S-11999)	.011
64-99	Brass Eyelet (S-11999)	.01
78-229	Electrolytic Socket	.024
78-275	Electrolytic Socket	.024
78-400	Loktal Base Tube Socket	.19
78-437	Miniature Base Tube Socket	.12
78-446	Loktal Base Tube Socket (3 used)	.19
78-637	Battery Cable Socket	.23
80-436	Tube Retaining Spring (117Z3)	.15
82-20	Battery Retaining Strip	.25
83-1393	Rubber Strip (Handle)	.30
85-367	Power Change Over Switch	.82
86-66	Pin Jack Terminal (Gang)	.02
86-142	Pin Jack Terminal (Gang)	.017
93-743	Bakelite Spacer Washer (S-11999)	.025
110-119	Grille Cloth	.15
112-468	#6 x 5/16 Phillips B H Self Tapping Screw (82-20)	1.83C
112-533	#6 x 1/4 Phillips R. H. Self Tapping Screw (40-28)	.02
112-604	#6 x 5/16 Phillips Stove Hd. Self Tapping Screw (Chassis Mtg.)	.027
126-482	Spiral Shield	.05
139-61	Baffle Board (or 139-66)	.08
156-27	Cover Catch (2 used)	.09
199-53	Flexible Handle Sleeve	.40
202-429	Instruction Book	.03
S-11999	Cabinet Back & Wavemagnet Assem.	...
	Complete (24-371) (L1)	4.75
S-13209	Front Cabinet & Hinge Assem. (14-903)	6.25
S-13210	Strap & Rivet Assem. (Handles)	.20

Prices subject to change without notice.

15M 2-10-47



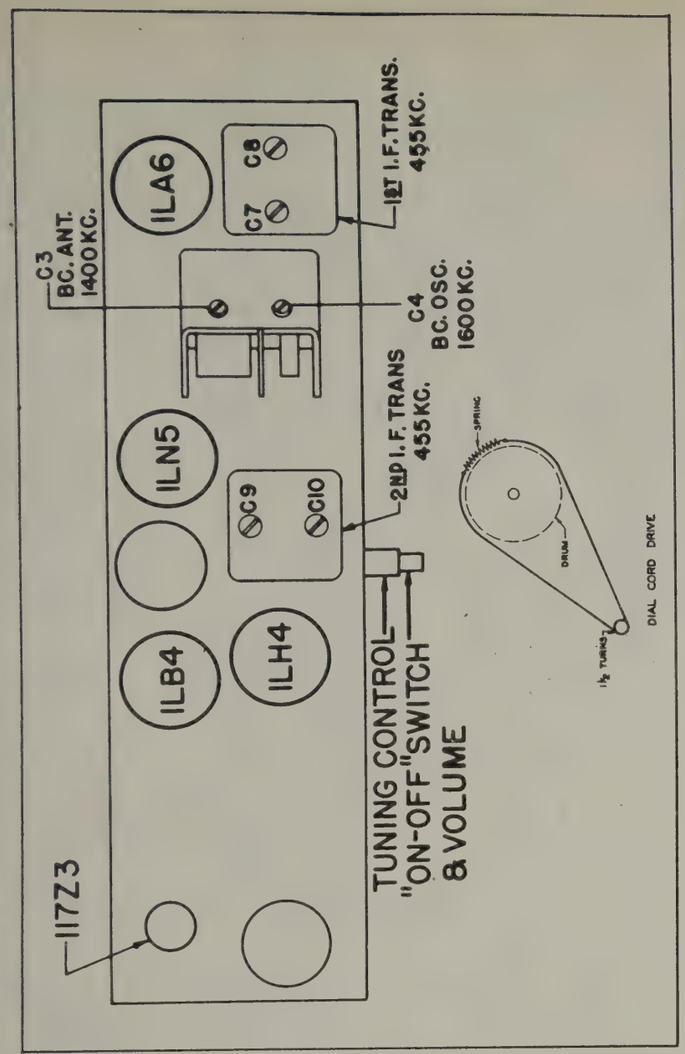
** CHASSIS PRODUCED WITH ALTERNATE TUBES AS FOLLOWS:

ORIGINAL	ALTERNATE
12SA7GT	12BE6
12SA7GT	14Q7
35Z5GT	35W4
12SQ7GT	12AT6
50L6GT	50B5

RESISTOR USED WITH ALTERNATE TUBES			
RX	63-577	100 OHM	1/4W.
12SK7	12BA6		

MODELS 5R080—5R086—5R086Z

MODEL 5G003
CHASSIS No. 5C40



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICEMAN:

The alignment of chassis 5C40 is conventional and the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electonic voltohm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455	600	C7,C8,C9 and C10	I.F. Alignment
2	Single Turn Loop	--	1600	1600	C4	Set Osc. to scale
3	Coupled Loosely to	--	1400	1400	C3	Alignment of Antenna
	Wavemagnet					

PARTS LIST

DIAL ASSEMBLY

26-366	Dial Scale	.12
46-530	Volume Control Knob (Small)	.17
46-587	Tuning Control Knob (Large)	.11
57-1120	Escutcheon Plate	1.00
57-1187	Dial Plate	.60
59-164	Dial Pointer	.19
76-488	Tuning Control Shaft	.28
80-365	Tuning Shaft Tension Spring (63-1459)	.03
80-508	Dial Cord Tension Spring	.04
125-17	Rubber Grommets (22-1450)	.03
147-148	Dial Plate Spacer	.02
159-50	Plug Button (26-366-192-99)	.01
188-53	Tuning Shaft Retainer Ring	.01
192-99	Dial Glass	.20
196-88	Dial Glass Gasket	.06
S-11098	Pulley & Bushing Assem	.33
S-11137	Dial Cord & Eyelet Assem	.09

CHOKES AND COILS

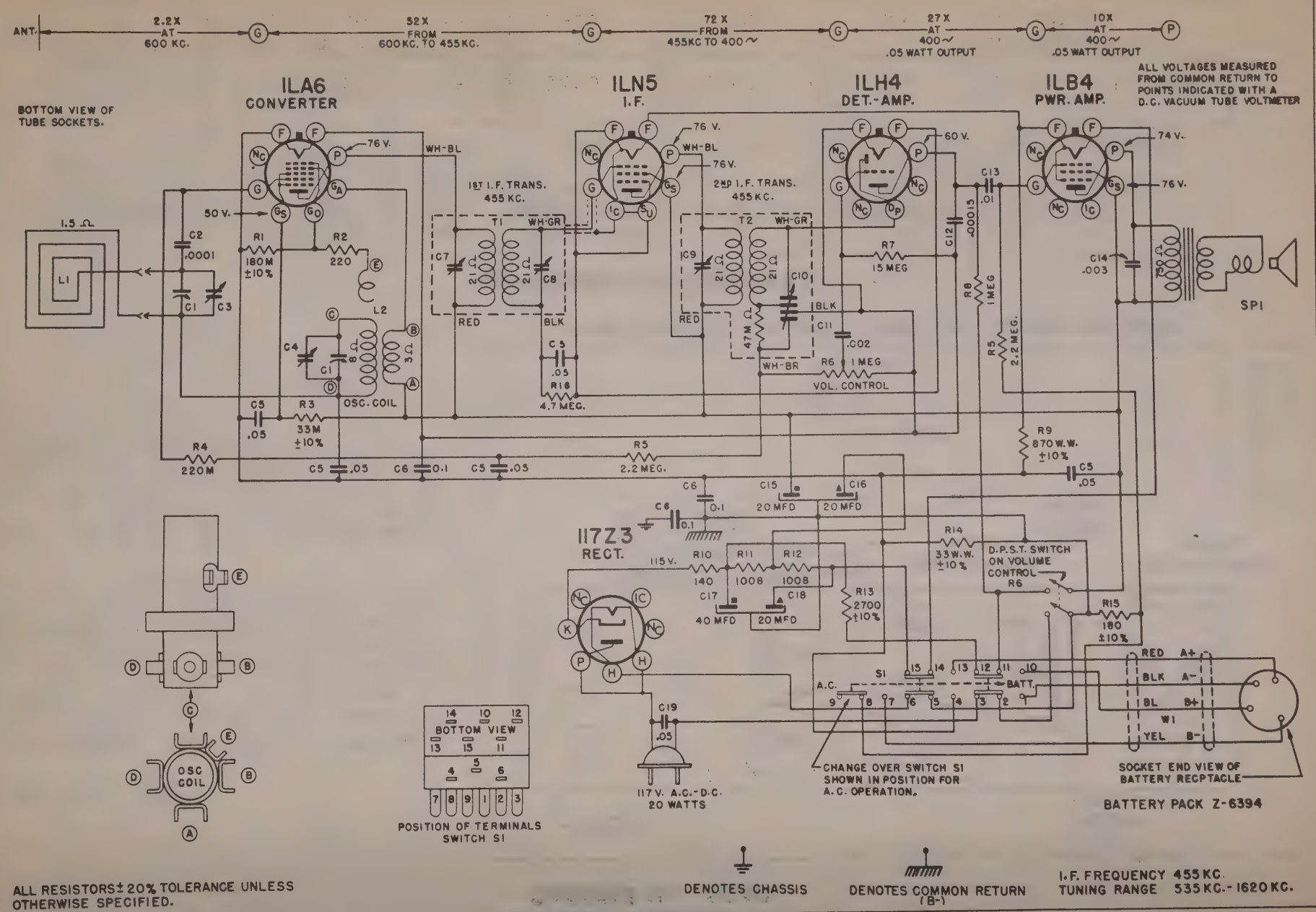
95-937	First I. F. Transformer (T1)	1.85
95-938	Second I. F. Trnasformer (T2)	1.85
S-11830	Osc. Coil Assem. (L2)	.95

CONDENSERS

22-162	.0001 Mfd. 500 Volt (C2)	.20
22-196	.01 Mfd. 600 Volt (C13)	.20
22-326	.003 Mfd. 400 Volt (C14)	.20
22-470	.00015 Mfd. 600 Volt (C12)	.20
22-492	.002 Mfd. 600 Volt (C11)	.20
22-827	.1 Mfd. 200 Volt (C6)	.23
22-829	.05 Mfd. 200 Volt (C5)	.20
22-1014	Dry Electrolytic 20 x 20 Mfd. - 150 V. (C15 & C16)	.95
22-1017	.05 Mfd. 200 Volt	.20
22-1081	Dry Electrolytic 40 x 20 Mfd. - 150 V. (C17 & C18)	.83
22-1450	Two Section Gang (C1)	4.15

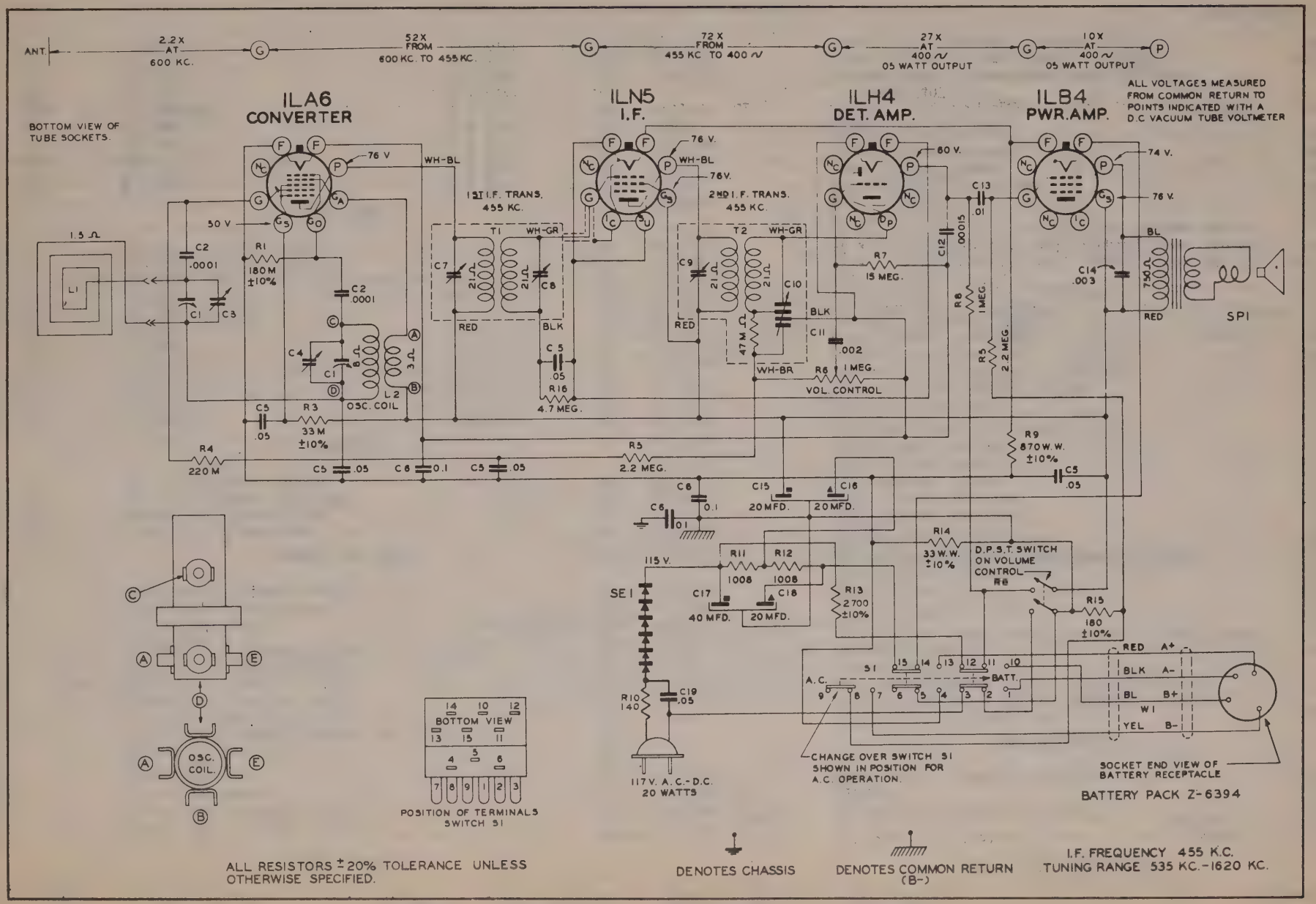
RESISTORS

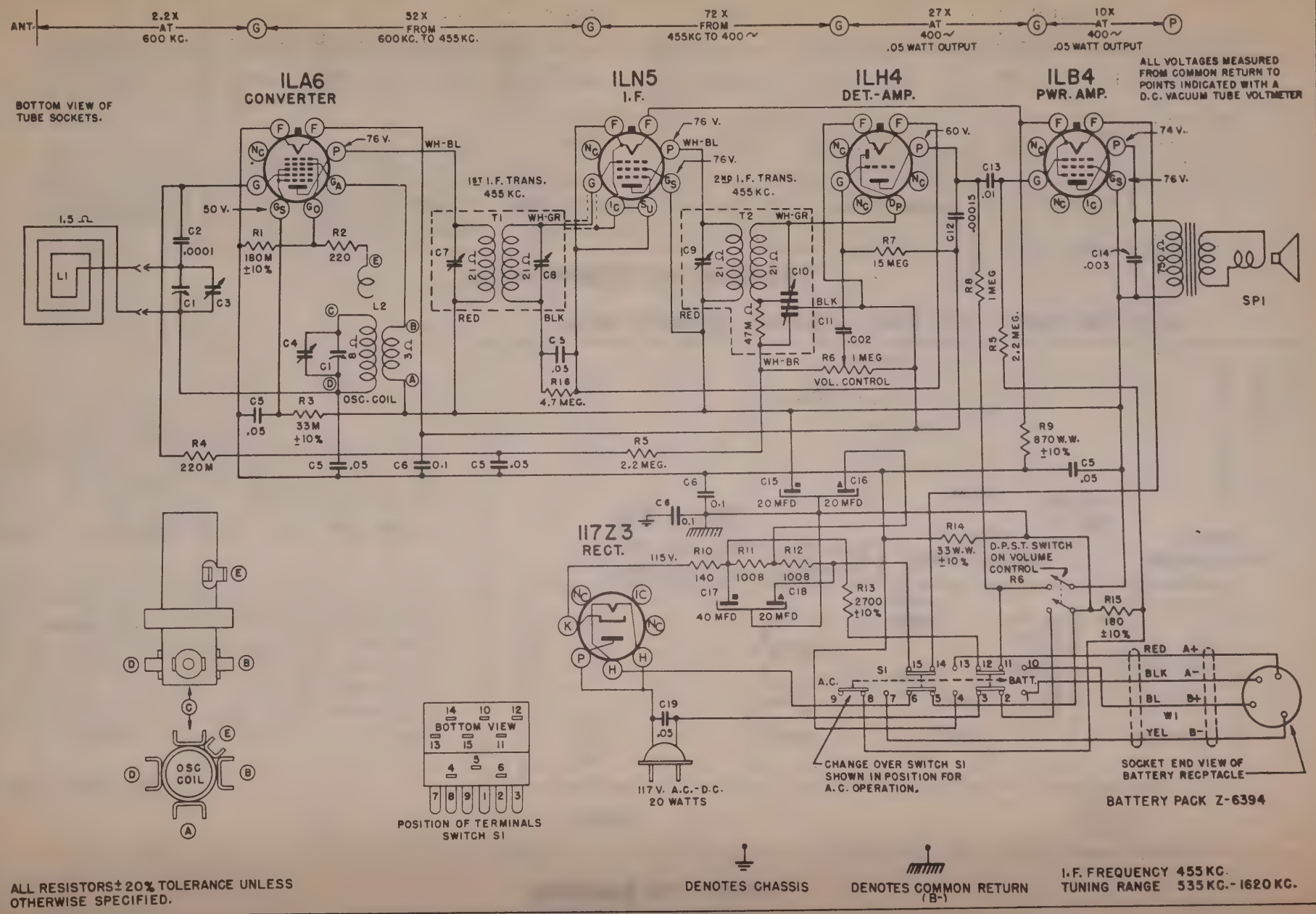
63-271	1 Megohm	½ Watt (R8)	.09
63-296	220 M Ohm	½ Watt (R4)	.09
63-439	2700 Ohm	½ Watt (R13)	.09
63-579	220 Ohm	½ Watt (R2)	.09
63-600	2.2 Megohm	½ Watt (R5)	.09
63-602	4.7 Megohm	½ Watt (R16)	.09
63-627	180 Ohm	½ Watt (R15)	.09
63-646	33 M Ohm	½ Watt (R3)	.09



MODEL 5G003

CHASSIS No. 5C40


ANT.
2.2 X AT 600 KC.
52 X FROM 600 KC. TO 455 KC.
72 X FROM 455 KC TO 400 ~
27 X AT 400 ~ 05 WATT OUTPUT
10 X AT 400 ~ 05 WATT OUTPUT
ILA6 CONVERTER
ILN5 I.F.
ILH4 DET. AMP.
ILB4 PWR. AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C VACUUM TUBE VOLTMETER
BOTTOM VIEW OF TUBE SOCKETS.
76 V
WH-BL
50 V
1ST I.F. TRANS. 455 KC.
2ND I.F. TRANS. 455 KC.
T1
T2
WH-GR
RED
BLK
WH-BR
OSC. COIL
VOL. CONTROL
R1 180 M ±10%
R2 33 M ±10%
R3 220 M
R4 4.7 MEG.
R5 2.2 MEG.
R6 1 MEG.
R7 15 MEG.
R8 1 MEG.
R9 870 W.W. ±10%
R10 140
R11 100Ω
R12 100Ω
R13 2700 ±10%
R14 33 W.W. ±10%
R15 180 ±10%
R16 4.7 MEG.
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19
20 MFD.
40 MFD.
D.P.S.T. SWITCH ON VOLUME CONTROL R6
115 V.
SE 1
S1
A.C.
BATT.
CHANGE OVER SWITCH S1 SHOWN IN POSITION FOR A.C. OPERATION.
117 V. A.C.-D.C. 20 WATTS
RED A+
BLK A-
BL B+
WH
YEL B-
SOCKET END VIEW OF BATTERY RECEPTACLE
BATTERY PACK Z-6394
SPI
OSC. COIL
BOTTOM VIEW
POSITION OF TERMINALS SWITCH S1
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
DENOTES COMMON RETURN (B-)
I.F. FREQUENCY 455 K.C.
TUNING RANGE 535 KC.-1620 KC.



MODEL 5G003

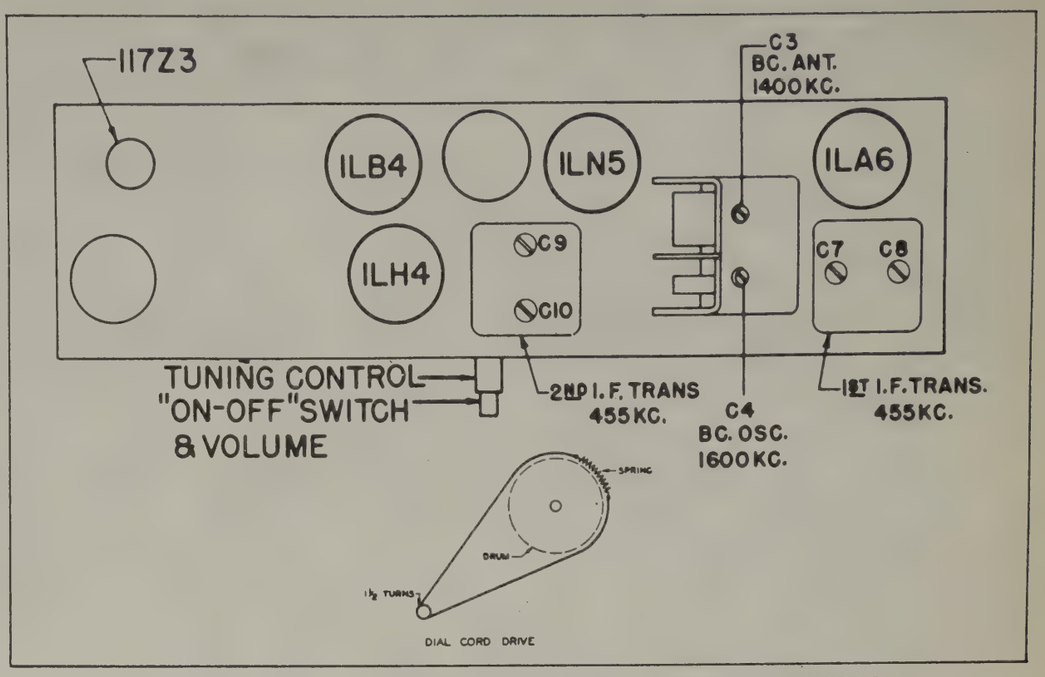
CHASSIS No. 5C40

MODELS 5G003Z - 5G003ZZ
CHASSIS Nos. 5C40Z - 5C40ZZ

TO THE SERVICEMAN:

The alignment of chassis 5C40 is conventional and the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

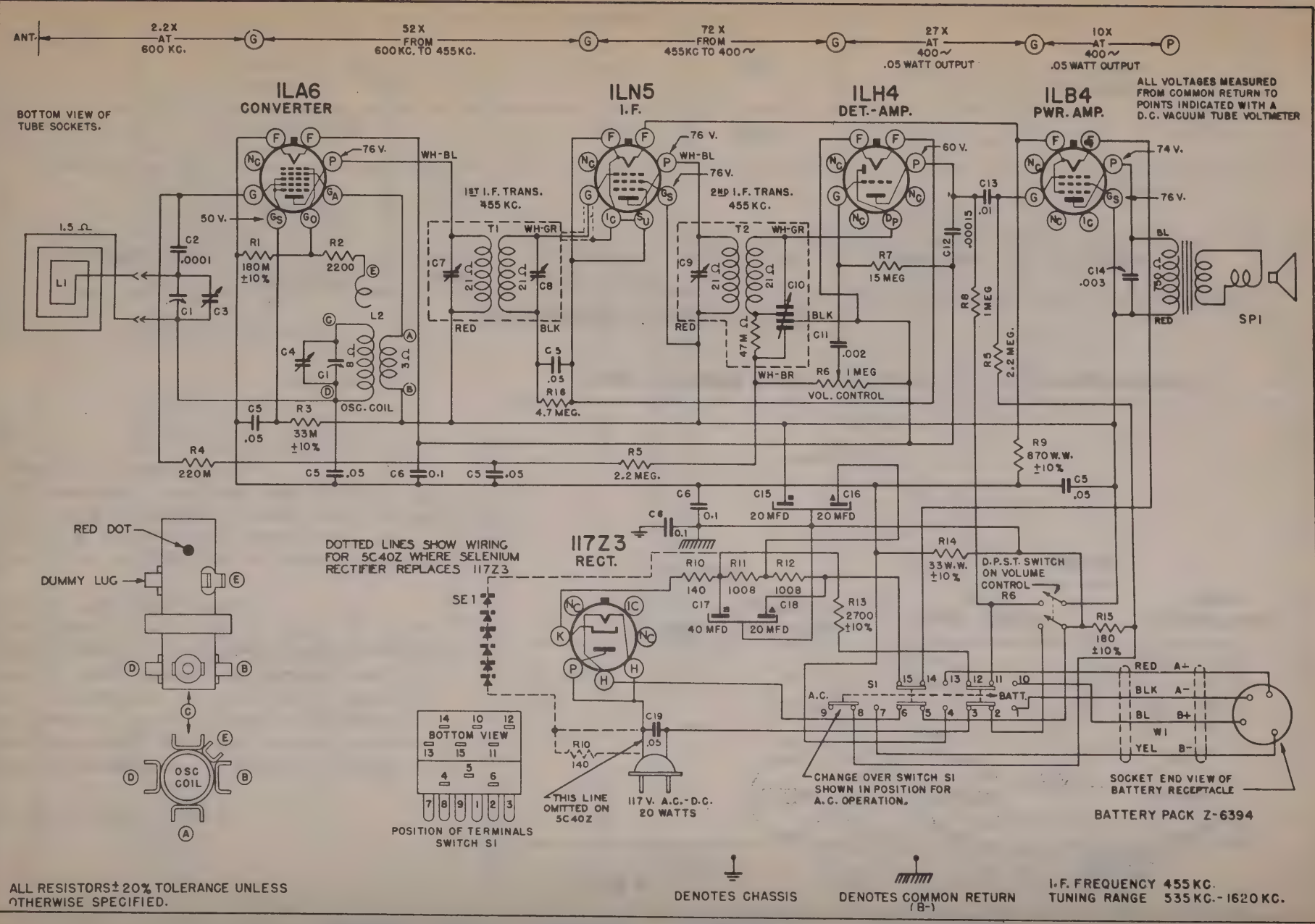
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455	600	C7, C8, C9 C10	I.F. Alignment
2	Single Turn Loop	--	1600	1600	C4	Set Osc. to scale
3	Coupled Loosely to Wavemagnet	--	1400	1400	C3	Alignment of Antenna

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-366		Dial Scale	.12
46-530		Volume Control Knob (Small)	.17
46-587		Tuning Control Knob (Large)	.11
57-1120		Escutcheon Plate	1.00
57-1187		Dial Plate	.60
59-164		Dial Pointer	.19
76-488		Tuning Control Shaft	.28
80-365		Tuning Shaft Tension Spring (63-1459)	.03
80-508		Dial Cord Tension Spring	.04
125-17		Rubber Grommets (22-1450)	.03
147-148		Dial Plate Spacer	.02
159-50		Plug Button (26-366-192-99)	.01
188-53		Tuning Shaft Retainer Ring	.01
192-99		Dial Glass	.20
196-88		Dial Glass Gasket	.06
S-11098		Pulley & Bushing Assembly	.33
S-11137		Dial Cord & Eyelet Assembly	.09
		CHOKES AND COILS	
95-937	T1	First I.F. Transformer	1.85
95-938	T2	Second I.F. Transformer	1.85
S-11830	L2	Osc. Coil Assem. 5C40-40Z	.95
S-13765	L2	Osc. Coil Assem. 5C40ZZ	.95
		CONDENSERS	
22-162	C2	.0001 Mfd. 500 Volt.	.20
22-196	C13	.01 Mfd. 600 Volt.	.20
22-326	C14	.003 Mfd. 400 Volt.	.20
22-470	C12	.00015 Mfd. 600 Volt.	.20
22-492	C11	.002 Mfd. 600 Volt.	.20
22-827	C6	.1 Mfd. 200 Volt.	.23
22-829	C5	.05 Mfd. 200 Volt.	.20
22-1014	C15 & C16	Dry Electrolytic 20 x 20 Mfd. 150 Volt.	.95
22-1017	C19	.05 Mfd. 200 Volt.	.20
22-1081	C17 & C18	Dry Electrolytic 40 x 20 Mfd. 150 Volt-25 Volt.	.83
22-1450	C1	Two Section Gang 5C40-40Z	4.15
22-1653	C1	Two Section Gang 5C40ZZ	4.15
		RESISTORS	
63-271	R8	1 Megohm 1/4 Watt.	.09
63-296	R4	220 M Ohm 1/4 Watt.	.09
63-439	R13	2700 Ohm 1/4 Watt.	.09
63-579	R2	220 Ohm. 1/4 Watt.	.09
63-600	R5	2.2 Megohm 1/4 Watt.	.09
63-602	R16	4.7 Megohm 1/4 Watt.	.09
63-627	R15	180 Ohm. 1/4 Watt.	.09
63-646	R3	33 M Ohm 1/4 Watt.	.09
63-654	R1	180 M Ohm. 1/4 Watt.	.09
63-976	R7	15 Megohm. 1/4 Watt.	.09
63-1097	R9	870 Ohm W. W. Insl. 1 Watt.	.24
63-1099	R14	33 Ohm W. W. Insl. 1/2 Watt.	.21
63-1363	R11-R12	Two Section Candohm (63-1132)	.60
63-1366	R10	Zipohn	.24
63-1549	R6	Vol. Control & Switch D P S T.	1.81
		MISCELLANEOUS	
11-70		A. C. Line Cord & Plug (Alt 11-90)	.60
12-1322		Reinforcing Brkt. (2 used Handle)	.15
14-903		Polystyrene Cabinet Front Less Accessories (use S-13209)	...
15-51		Battery Socket Cap	.09
24-371		Cabinet Rear Cover Less Accessories (Use S-11999)	...
40-28		Cabinet Hinge	.20
43-111		Handle End Pieces (Die Cast)	.65
49-540		4" P M Speaker (Complete)	7.25
		206-540 Output Transformer	1.67
		208-540 Cone & Voice Coil Assem.	1.73
54-224		Speed Nut (2 used S-11999)	.02
57-1119		Chassis Bottom Plate	.24
64-98		Brass Eyelet (S-11999)	.02
64-99		Brass Eyelet (S-11999)	.01
78-229		Electrolytic Socket	.03
78-275		Electrolytic Socket	.03
78-400		Loktal Base Tube Socket	.19
78-437		Miniature Base Tube Socket	.12
78-446		Loktal Base Tube Socket (3 used)	.19
78-637		Battery Cable Socket	.23
80-436		Tube Retaining Spring (117Z3)	.15
82-20		Battery Retaining Strip	.25
83-1393		Rubber Strip (Handle)	.30
85-367-S1		Power Change Over Switch	.82
86-66		Pin Jack Terminal (Gang)	.02
86-142		Pin Jack Terminal (Gang)	.02
93-743		Bakelite Spacer Washer (S-11999)	.03
110-119		Grille Cloth	.15
112-468		#6 x 5/16 Phillips B H Self Tapping Screw (82-20)	1.83C
112-533		#6 x 1/4 Phillips R.H. Self Tapping Screw (40-28)	.02
112-604		#6 x 5/16 Phillips Stove Hd. Self Tapping Screw (Chassig Mtg.)	.03
126-482		Spiral Shield	.05
139-61		Baffle Board (or 139-66)	.08
156-27		Cover Catch (2 used)	.09
199-53		Flexible Handle Sleeve	.40
202-429		Instruction Book	.03
212-2		Selenium Rectifier	
S-11999	L1	Cabinet Back & Wavemagnet Assem. Complete (24-371) 5C40-5C40Z	4.75
S-13767		Cabinet Back & Wavemagnet Assem. ZZ Model	...
S-13209		Front Cabinet & Hinge Assem. (14-903)	6.25
S-13210		Strap & Rivet Assem. (Handles)	.20

Prices subject to change without notice.



MODEL 5G003 5G003Z **CHASSIS** No. 5C40 5C40Z

PARTS LIST

DIAL ASSEMBLY

26-344	Dial Scale	.32
46-443	Radiorgan Knob (Voice)	.07
46-444	Radiorgan Knob (Treble)	.07
46-445	Radiorgan Knob (Alto)	.07
46-446	Radiorgan Knob (Bass)	.07
59-122	Off & On Indicator	.12
59-160	Dial Pointer	1.14
76-335	Tuning Control Shaft	.07
80-183	Indicator Spring	.03
80-209	Dial Cord Tension Spring	.03
80-471	Tuning Shaft Spring	1.31C
93-690	Brown Felt Washer (S-11362)	.60C
188-32	Retainer Ring (76-335)	1.03C
188-34	Retainer Ring (S-11362)	1.20C
192-90	Dial Crystal	.50
196-64	Dial Crystal Gasket	.08
S-9588	Indicator Cam & Bushing Assembly	.07
S-9610	Dial Cord & Eyelet Assem (Pointer)	.12
S-9733	Dial Cord & Eyelet Assem (Gang)	.07
S-9751	Pulley & Rivet Assem. (Gang)	.12
S-11362	Pulley & Bushing Assem.	.11
S-11558	Vol. & Tuning Knob Assem (2 used) (46-520)	.28

CHOKES & COILS

95-814	1st I.F. Transformer. (T1)	1.77
95-839	2nd I.F. Transformer (T2)	1.77
S-9570	Detector Coil Assem. (L2)	.69
S-9746	Oscillator Coil Assem (L3)	.90
S-11731	Antenna Coil Assem. (L1)	1.35

CONDENSERS

22-162	.0001 Mfd. (C6) 600 V.	.20
22-182	.00025 Mfd. (C17) 600V.	.26
22-196	.01 Mfd. (C12) 600V.	.20
22-448	.004 Mfd. (C15) 600V.	.20
22-492	.002 Mfd. (C16) 600V.	.20
22-684	Dry Electroclytic 8Mfd. (C13) 150 V.	.45
22-829	.05 Mfd (C3) 200 V.	.20
22-887	.001 Mfd. (C14). 600V.	.20
22-1358	Three Section Gang (C1)	4.50
22-1421	Antenna Trimmer (C2)	.40

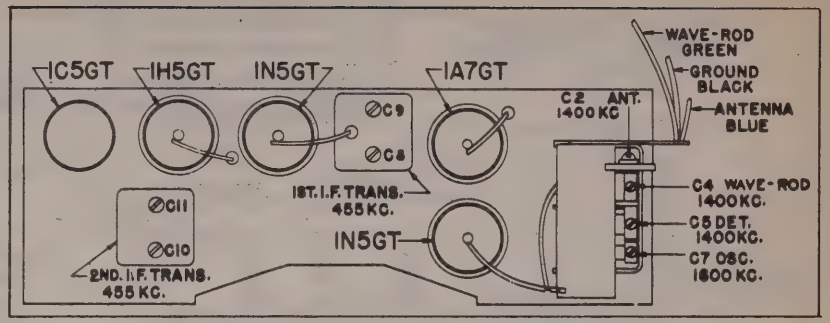
RESISTORS

63-271	1 Megohm (R10) ¼ Watt	.09
63-581	470 Ohm (R3) ¼ Watt	.09
63-587	4700 Ohm (R8) ¼ Watt	.09
63-594	68M Ohm (R4) ¼ Watt	.09
63-600	2.2 Megohm (R11) ¼ Watt	.09
63-634	820 Ohm (R5) ¼ Watt	.09
63-638	5600 Ohm (R1) ¼ Watt	.09
63-669	3.9 Megohm (R6) ¼ Watt	.09
63-976	15 Megohm (R9) ¼ Watt	.09
63-1236	Volume Control & Switch (R7)	1.81

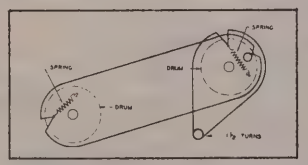
MISCELLANEOUS

12-1082	Ant. Rod Mtg. Brkt.	.06
46-572	Telescopic Ant. Knob	.12
49-522	6½" P.M. Speaker	10.00
	206-522 Output Trans.	2.21
	208-522 Cone & Voice Coil	2.09
49-523	6½" P.M. Speaker (Alt. for 49-522) (SP1)	10.00
	206-523 Output Trans.	2.21
	208-523 Cone & Voice Coil	2.09
52-190	Speaker Cable	.19
57-11A	Antenna Marker	.03
57-11G	Ground Marker	.03
57-900	Dial Plate	.35
57-1103	Antenna Knob Escutcheon	.70
57-1139	Radiorgan Escutcheon	.18
58-74	Battery Cable Plug	.12
70-124	#2 x 3/8 Phillips Hd. Wood Screw (Esc. Mtg)	1.70C
78-611	Octal Base Tube Socket 5 used	.12
85-228	Wave-Rod Antenna Sw. (CR 85-303) (S1)	.31
85-284	Radiorgan Switch (Voice & Alto L.H) (S2)	.55
85-288	Radiorgan Switch (Treble & Bass R.H. (S3)	.55
93-125	#6 Internal Shakeproof Lockwasher	.31C
93-258	Brown Felt Washer (Knobs)	.78C
94-295	Steel Bushing (Radiorgan 4 used)	.04
112-56	#6 - ¼ Hex Hd. Self Tapping Screw	.55C
114-67	#6-32 x 7/16 Hex Acorn Head Screw	.43C
114-162	#8 x 7/8 Hex Acorn Washer Hd S.T. Screw (Chassis Mtg)	1.20C
125-17	Rubber Grommets	.03
126-379	Tube Shield (3used) short	.07
126-382	Tube Shield (1A7GT) long.	.08
159-50	Plug Button (Blk Oxidize)	.01
202-386	Instruction Book	.25
S-11251	Telescopic Antenna Assem. (Complete)	7.85
S-11586	Release Assem. (Telescopic Assembly)	.50
S-11729	Waverod switch & Plate Assembly	.75
Z-28	Battery Pack (BP)	

Prices Subject To Change Without Notice.
15M2-15-47



TUBE TRIMMER LOCATION



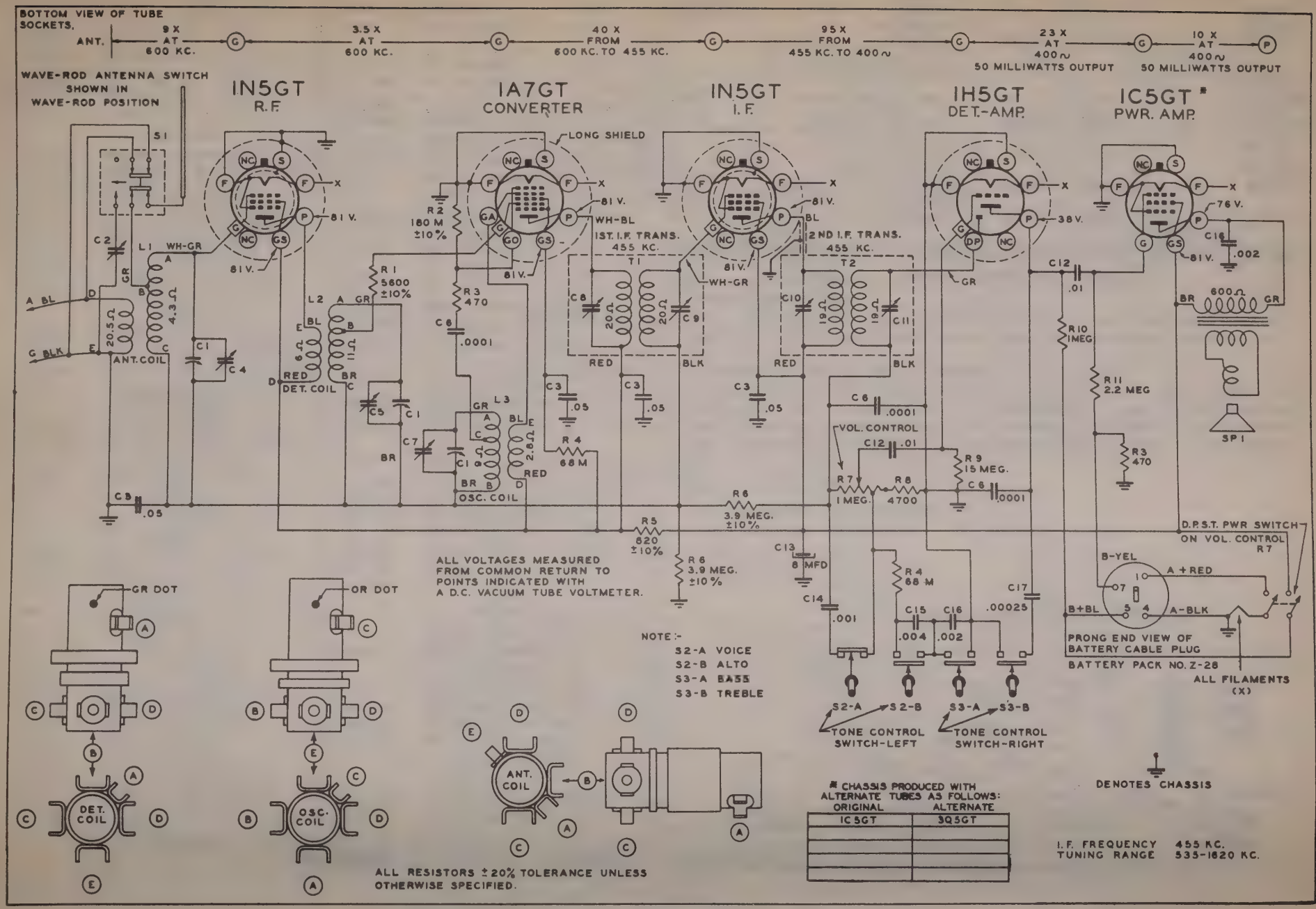
DIAL CABLE DRAWING

TO THE SERVICEMAN:

The alignment of chassis 5C50 is conventional. None of the adjustment interlock, however, the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C8, C9, C10, and C11	Align I.F
2	Ant. and Ground	200Mmfd Antenna Switch in Ant. position	1600 Kc.	1600 Kc.	C7	Set Oscillator to Dial Scale.
3	"	"	1400 Kc.	1400 Kc.	C5	Align Detector
4	"	"	"	"	C2	Align Antenna
5	Two Turns Loosely Coupled To Waverod	Wave Rod Fully extended Switch in Waverod Position	1400 Kc.	1400 Kc.	C4	Align Waverod Antenna

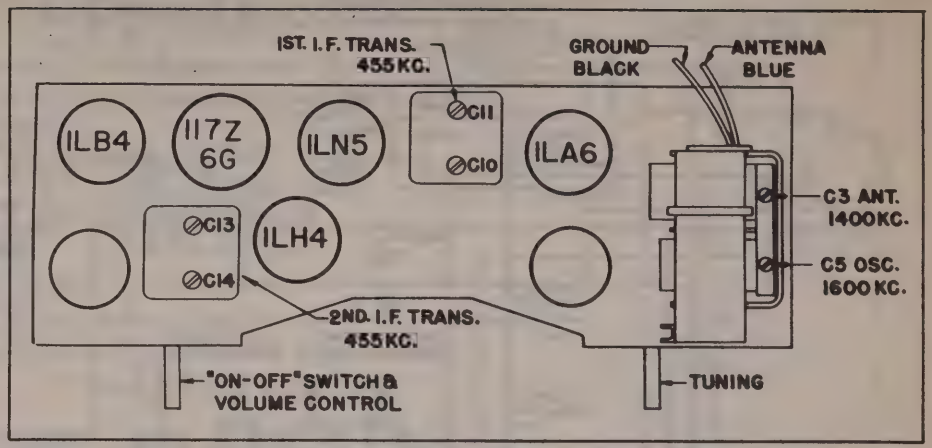


MODEL 5K037 CHASSIS No. 5C50

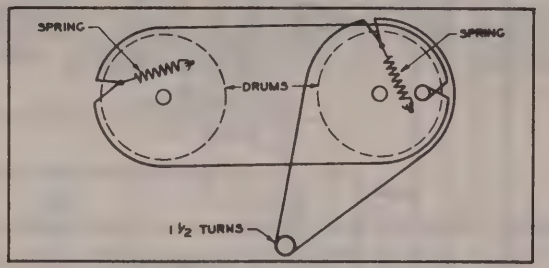
PARTS LIST

PART NO.	REF. NO.		PRICE
		DIAL ASSEMBLY	
26-339		Dial Scale	.24
46-443		Radiorgan Knob - Voice	.07
46-444		Radiorgan Knob - Treble	.07
46-445		Radiorgan Knob - Alto	.07
46-446		Radiorgan Knob - Bass	.07
46-520		Volume & Tuning Control Knob (Use S-11558)	---
59-122		On-Off Indicator	.12
59-160		Dial Pointer	1.14
76-335		Tuning Control Shaft	.07
80-183		Indicator Spring	.03
86-206		Dial Cord Tension Spring	.03
86-471		Tuning Shaft Spring	1.31 C
93-690		Brown Felt Washer	.60 C
159-50		Cinch Plug Button #49361 - Black Oxidize	.01
188-32		Retaining Ring (76-335)	1.03 C
188-34		Retaining Ring (S-11362)	1.20 C
192-90		Dial Crystal	.50
196-64		Dial Crystal Gasket	.08
S-8588		Indicator Cam Assembly	.07
S-9610		Dial Cord & Eyelet Assembly (Pointer)	.12
S-9733		Dial Cord & Eyelet Assembly (Gang Condenser)	.07
S-9751		Pulley & Rivet Assembly	.12
S-11362		Pulley & Bushing Assembly (Pointer)	.11
S-11558		Decorative Ring & Control Knob Assembly (2 used)	.28
S-11660		Dial Plate & Indicator Assembly	1.00
		COILS & CHOKES	
95-816	T1	1st I.F. Transformer	1.39
95-817	T2	2nd I.F. Transformer	1.77
S-11960	L1	Antenna Coil Assembly	.50
S-12505	L2	Oscillator Coil Assembly	1.25
		CONDENSERS	
22-182	C6	.0001 Mfd. 600 V.	.20
22-182	C17	.00025 Mfd. 600 V.	.26
22-196	C16	.01 Mfd. 600 V.	.20
22-303	C23	5 Mmfd. 600 V.	.20
22-448	C20	.004 Mfd. 600 V.	.20
22-470	C15	.00015 Mfd. 600 V.	.20
22-492	C18	.002 Mfd. 600 V.	.20
22-827	C7	.1 Mfd. 200 V.	.23
22-829	C4	.05 Mfd. 200 V.	.20
22-867	C19	.001 Mfd. 600 V.	.20
22-1017	C12	.05 Mfd. 400 V.	.20
22-1026	C21-C22	20 Mfd. X 40 Mfd. Dry Electrolytic 150 V.	1.50
22-1027	C8-C9	20 Mfd. 25 V. X 20 Mfd. 150 V. Dry Electrolytic	.52
22-1163	C2	.01 Mfd. 400 V.	.20
22-1216	C1	Two Section Variable	2.56

PART NO.	REF. NO.		PRICE
		RESISTORS	
63-271	R8	1 Megohm 1/4 Watt	.09
63-439	R14	2700 Ohm 1/4 Watt	.09
63-567	R6	4700 Ohm 1/4 Watt	.09
63-594	R5	68M Ohm 1/4 Watt	.09
63-600	R3	2.2 Megohm 1/4 Watt	.09
63-627	R15	180 Ohm 1/4 Watt	.09
63-646	R2	33M Ohm 1/4 Watt	.09
63-654	R1	180M Ohm 1/4 Watt	.09
63-676	R7	15 Megohm 1/4 Watt	.09
63-1088	R10	33 Ohm W.W. Insul. 1/2 Watt	.24
63-1236	R4	Volume Control & Switch	1.81
63-1239	R12	Candohm (or 63-1465)	.60
63-1366	R11	140 Ohm W.W. (Used only when using 63-1465) 2 Watt	.24
63-1658	R9	820 Ohm W.W. Insul. 1 Watt	.24
		MISCELLANEOUS	
11-68		Line Cord & Plug	.65
15-67		Battery Cable Plug Cap	.08
49-523	SP1	6 1/2" P.M. Speaker	10.00
		206-523 Output Transformer	2.21
		208-523 Cone & Voice Coil	2.08
52-190		Speaker Cable & Plug	.19
54-34		#6-32 x 1/4" x 3/32" Hex Nut - Steel N.P.	.31 C
57-11A		Antenna Lead Marker	.03
57-11G		Ground Lead Marker	.03
57-1159		Radiorgan Escutcheon	.18
70-124		#2 x 3/8" Phillips Hd. Wood Screw-Brass Plated (57-1159)	1.76 C
78-229		Electrolytic Condenser Socket	.03
78-348		Battery Cable Socket	.07
78-401		Loktal Base Tube Socket (or 78-596-729)	.19
78-456		Loktal Base Tube Socket (7 contact)	.19
78-611		Octal Base Tube Socket (8 contact)	.12
85-254	S3	Power Change Over Switch	.46
85-284	S1	Radiorgan Switch (Voice & Alto) (Left)	.55
85-288	S2	Radiorgan Switch (Treble & Bass) (Right)	.55
93-125		#6 Internal Shakeproof Lockwasher	.31 C
93-256		Brown Felt Washers (Knobs)	.78 C
94-295		Radiorgan Switch Mounting Bushing (4 used)	.04
112-56		#6 x 1/4" Hex Hd. Self Tapping Screw	.55 C
114-67		#6-32 x 7/16" Hex Acorn Hd. Mach. Screw-Steel N.P.	.43 C
114-162		#6 x 7/8" Hex Acorn Washer Self Tapping Screw (Chassis Mtg.)	1.20 C
125-17		Rubber Grommets	.02
202-365		Instruction Book	.20



TUBE TRIMMER LOCATION



DIAL CABLE DRAWING

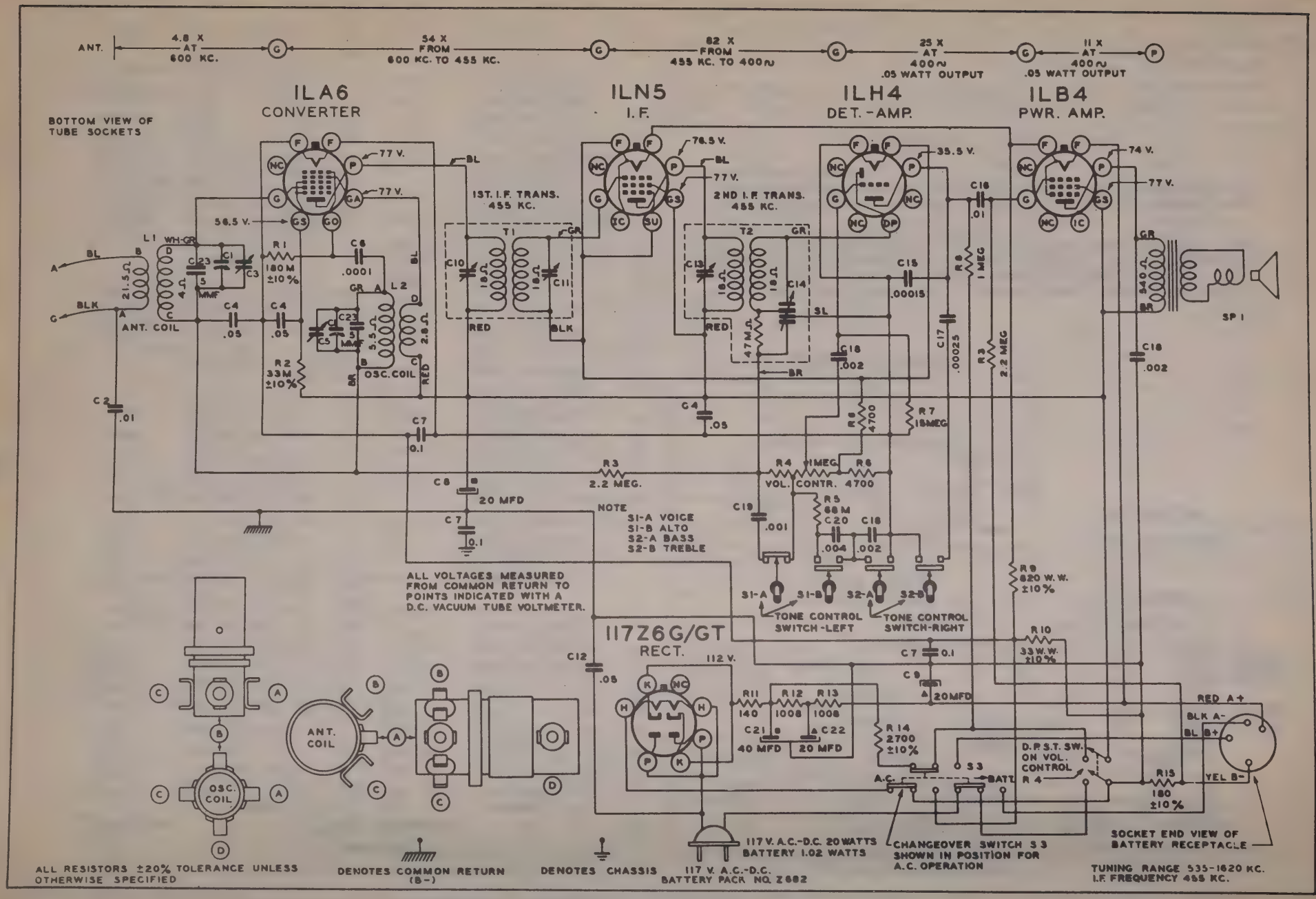
TO THE SERVICEMAN:

The alignment of chassis 5C51 is conventional. None of the adjustment interlock, however, the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohm meter.

Stage by stage measurements are for reference purposes only Gain measurements can seldom be duplicated, and are used only for comparison purposes.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C10, C11 C13 and C14	Align I.F.
2	Antenna and Ground	200 Mmfd.	1600 Kc.	1600 Kc.	C5	Set Oscillator to scale
3	Antenna and Ground	200 Mmfd.	1400 Kc.	1400 Kc.	C3	Align Antenna

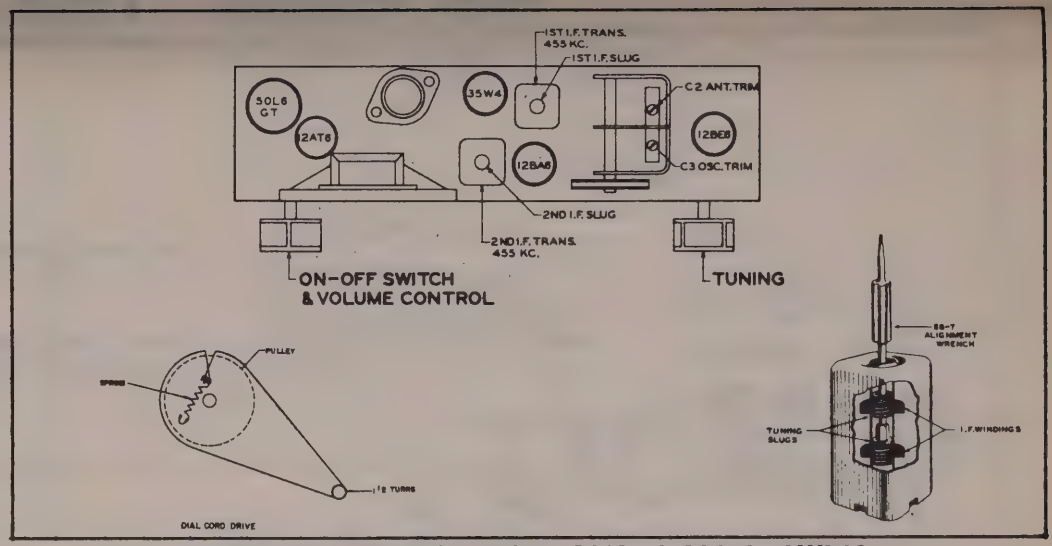


MODEL 5G036 CHASSIS No. 5C51

PARTS LIST

PART NO.		DIAL ASSEMBLY		PRICE
26-414		Dial Scale		1.10
59-222		Dial Pointer		.30
76-515		Tuning Shaft		.17
78-820		Pilot Light Socket & Wire		.25
80-209		Dial Cord Tension Spring		.03
100-67		Dial Light Bulb - 6.3V. -.15 Amp.		.09
188-32		Retaining Ring		1.03C
188-54		Retaining Ring (Pointer)		.02
S14843		Dial Cord & Eyelet Assem.		.07
		COILS & CHOKES		
95-1101		1st I.F. Transformer		1.60
95-1102		2nd I.F. Transformer		1.60
S14842		Osc. Coil Assem.		.35
		CONDENSERS		
22-162	C-14	100 Mmfd. (or 22-1669)	500V.	.20
22-829	C-4	.05 Mfd.	200V.	.20
22-854		.0005 Mfd.	600V.	.20
22-1158	C-11	.05 Mfd.	200V.	.20
22-1379	C-13	.02 Mfd.	400V.	.20
22-1775	C-5	.047 Mfd.	400V.	.26
22-1804	C15, 16	Dry Electrolytic 60 x 20 Mfd.	150V.	1.95
22-1807	C-1	Two Section Gang		3.25
105-14	U-1	Dual Ceramic		
		RESISTORS		
63-686	R-9	150 Ohm W.W. Insl.	1/2W	.21
63-1219	R-11	22 Ohm W.W. Insl.	1/2W	.21
63-1574	R-10	10000 Ohm Insl.	1W	.24
63-1660	R-4	Vol. Con. & Sw.		1.81
63-1737	R-2	68 Ohm Insl.	1/2W	.21
63-1782	R-5	820 Ohm Insl.	1/2W	.21
63-1814	R-6	4700 Ohm Insl.	1/2W	.21
63-1828	R-1	10M Ohm Insl.	1/2W	.21
63-1898	R-8	470M Ohm Insl.	1/2W	.21
63-1926	R-3	2.2 Megohm Insl.	1/2W	.21
63-1940	R-7	4.7 Megohm Insl.	1/2W	.21
		MISCELLANEOUS		
11-79		Line Cord & Plug (6 Ft.)		.65
14-1011		Model 811 Plastic Cabinet		3.75
14-1011W		Model 811W Plastic Cabinet		5.25
14-1011Y		Model 811Y Plastic Cabinet		4.50
43-165		Handle Housing		1.00
46-744		Tuning & Vol. Con. Knob (2 Used) (5D811)		.15
46-744Y		Tuning & Vol. Con. Knob (2 Used) (5D811W - 811Y).		.15
49-645	SP-1	4" P.M. Speaker		6.00
		206-645 Output Trans.		1.67
		208-645 Cone & Voice Coil		1.73
54-211		Speed Nut		.01
57-1408		Cabinet Front Plate		.70
78-275		Socket - Electrolytic		.03
78-611		Socket - Octal Tube (8 Contact)		.12
78-806		Socket - Miniature Tube		.15
78-807		Socket - Miniature Tube		.15
83-1057		Line Cord Insulating Strip		.02
83-1393		Rubber Strip (Handle)		.30
93-487		1/16 x .144 x 3/8 Steel Washer		.01
94-334		Gang Cond. Mtg. Bushing		.67C
102-543		Insignia Label		.01
112-407		#6 x 3/8 R.H.S.T. Screw		.02
112-697		#6 x 7/16 Straight Side B.H.S.T. Screw		.02
114-67		#6-32 x 7/16 Hex Acorn Hd. M.S. (3 Used)		.43C
114-217		#8 x 1/4 Hex Hd. Slotted S. T. Screw (2 Used)		.75C
125-17		Rubber Grommet		.03
139-74		Spk. Baffle		.20
159-69		Trimount Stud (Cab. Back Mtg.)		.01
166-44		Rubber Bumper (or 166-41)		.02
199-103		Flexible Handle Sleeve (5D811)		.35
199-103Y		Flexible Handle Sleeve (5D811W-811Y)		.35
202-665		Instruction Book		.02
S13210		Strip & Rivet Assem. (Handle Strap)		.20
S14952		Front Plate & Spk. Baffle Assem.		1.00
S14976	L-1	Wavemagnet Assem. (5D811-811Y)		1.10
S14977	L-1	Wavemagnet Assem. (5D811W)		1.25

Prices subject to change without notice.
ZENITH RADIO CORPORATION



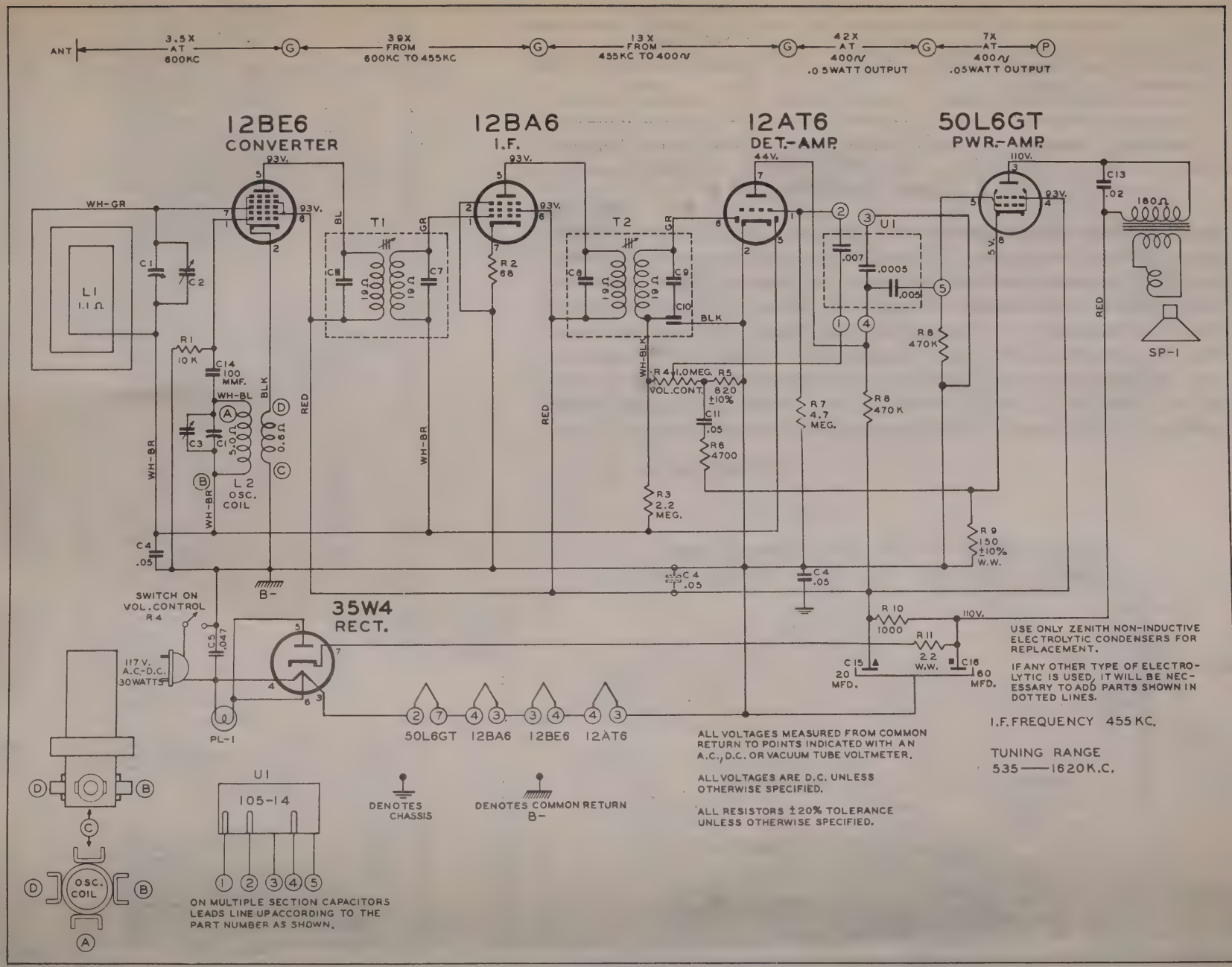
TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

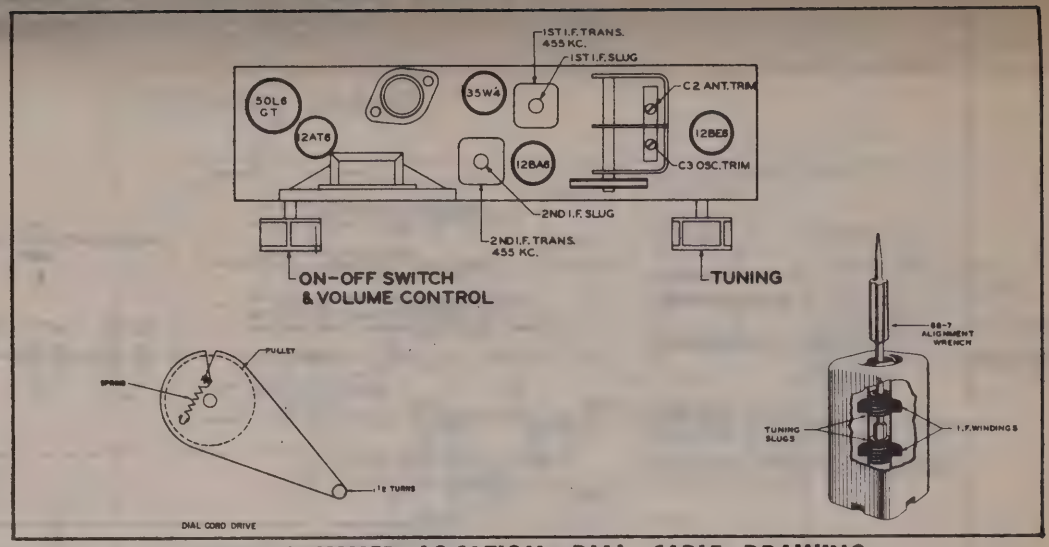


MODELS 5D811 CHASSIS 5E01

PARTS LIST

PART NO.		DIAL ASSEMBLY			PRICE
26-415		Dial Scale			.95
59-222		Dial Pointer			.30
76-515		Tuning Shaft			.17
80-209		Dial Cord Tension Spring			.03
188-32		Retaining Ring			1.03C
188-54		Retaining Ring (Pointer)			.02
S14843		Dial Cord & Eyelet Assem.			.07
		COILS & CHOKES			
95-1101	T-1	1st. I. F. Transformer			1.60
95-1102	T-2	2nd. I. F. Transformer			1.60
S14842	L-2	Oscillator Coil Assem.			.35
		CONDENSERS			
22-162	C-14	100 Mfd. (or 22-1669)	500V.		.20
22-829	C-4	.05 Mfd.	200V.		.20
22-854		.0005 Mfd.	600V.		.20
22-1158	C-4	.05 Mfd.	200V.		.20
22-1379	C-13	.02 Mfd.	400V.		.20
22-1775	C-5	.047 Mfd.	400V.		.26
22-1804	C15, 16	Dry Electrolytic 60 x 20 Mfd.	150V.		1.95
22-1807	C-1	Two Section Gang			3.25
105-14	U-1	Dual Ceramic			
		RESISTORS			
63-686	R-7	150 Ohm W.W. Insl.	1/2W		.21
63-1219	R-9	22 Ohm W.W. Insl.	1/2W		.21
63-1574	R-10	1 M Ohm Insl.	1W		.24
63-1575	R-13	39 Ohm W.W. Insl.	2W		.33
63-1660	R-4	Vol. Con. & Sw.			1.81
63-1737	R-12	68 Ohm Insl.	1/2W		.21
63-1782		820 Ohm Insl.	1/2W		.21
63-1814		4700 Ohm Insl.	1/2W		.21
63-1828	R-1	10M Ohm Insl.	1/2W		.21
63-1898	R-6	470M Ohm Insl.	1/2W		.21
63-1926	R-3	2.2 Megohm Insl.	1/2W		.21
63-1940	R-2	4.7 Megohm Insl.	1/2W		.21
		MISCELLANEOUS			
11-79		Line Cord & Plug (6 Ft.)			.65
14-1010		Model 810Y Plastic Cabinet			3.50
46-745Y		Tuning & Vol. Con. Knob (2 Used)			.15
49-645	SP-1	4" P.M. Speaker			6.00
		206-645 Output Trans.			1.67
		208-645 Cone & Voice Coil			1.73
54-139		#3/8-32 x 9/16 Palnut			.01
54-211		Speed Nut			.01
54-267		#6-32 x 5/16 Palnut			.45C
57-1407		Cabinet Front Plate			.70
78-275		Socket - Electrolytic			.03
78-611		Socket - Octal Tube (8 Contact)			.12
78-806		Socket - Miniature Tube			.15
78-807		Socket - Miniature Tube (3 Used)			.15
83-1057		Line Cord Insulating Strip			.02
94-334		Gang Cond. Mtg. Bushing			.67C
112-697		#6 x 7/16 Straight Side B.H.S.T. Screw			.02
114-67		#6-32 x 7/16 Hex Acorn Hd. M.S.			.43C
114-217		#8 x 1/4 Hex Hd. Slotted S. T. Screw			.75C
125-17		Rubber Grommet			.03
139-73		Spk. Baffle			.20
159-69		Trimount Stud (Cab. Back Mtg.)			.01
166-44		Rubber Bumper (or 166-41)			.02
202-665		Instruction Book			.02
S14879	L-1	Wavemagnet Assem.			1.10
S14951		Front Plate & Spk. Baffle Assem.			1.00

Prices subject to change without notice.
ZENITH RADIO CORPORATION



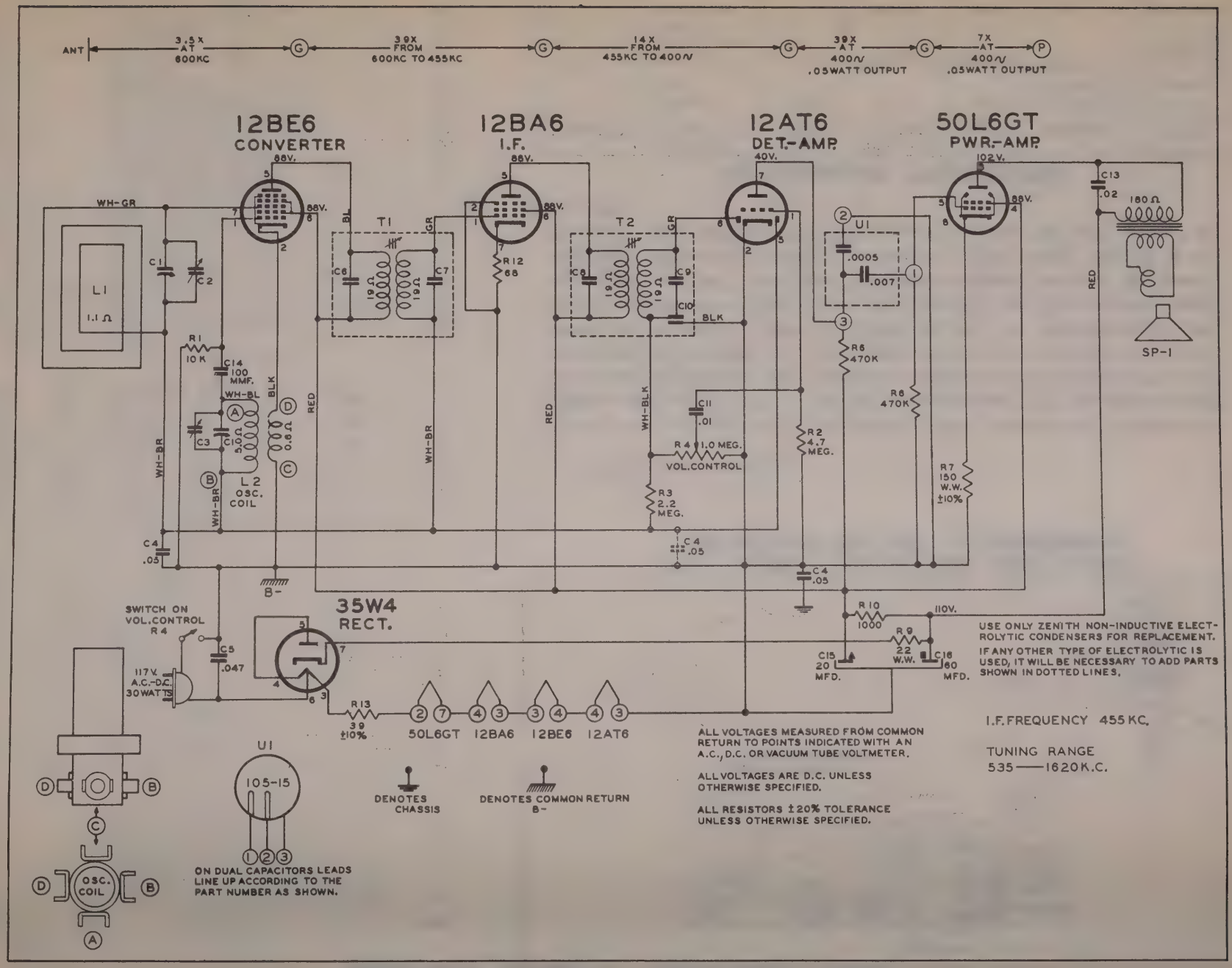
TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

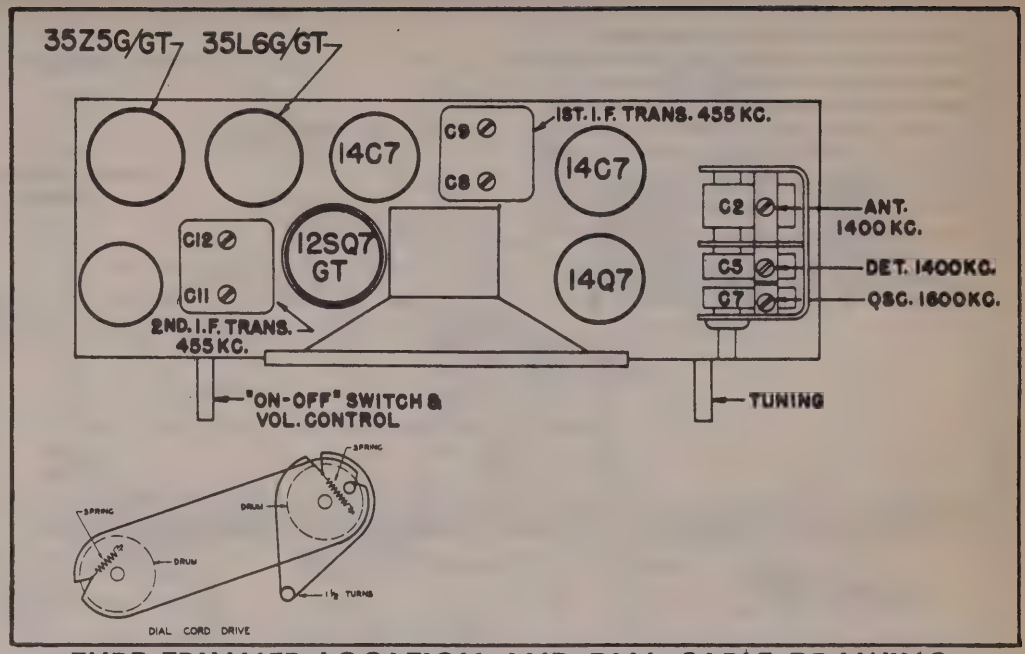

ANT
3.5 X AT 600KC
G
39X FROM 600KC TO 455KC
14X FROM 455KC TO 400~
39X AT 400~ .05WATT OUTPUT
7X AT 400~ .05WATT OUTPUT
P
12BE6 CONVERTER
12BA6 I.F.
12AT6 DET.-AMP.
50L6GT PWR.-AMP.
WH-GR
L1 1.1Ω
C1
C2
R1 10K
C14 100 MMF.
WH-BL
BLK
RED
WH-BR
C3
C10 5.0Ω
0.6Ω
L2 OSC. COIL
C4 .05
B-
T1
T2
C6
C7
C8
C9
C10
19Ω
R12 68
BL
GR
BLK
WH-BLK
C11 .01
R4 1.0 MEG. VOL. CONTROL
R3 2.2 MEG.
R2 4.7 MEG.
U1
.0005
.007
R5 470K
R6 470K
R7 150 W.W. ±10%
C13 .02
180Ω
SP-1
35W4 RECT.
SWITCH ON VOL. CONTROL R4
C5 .047
117V. A.C.-D.C. 30 WATTS
R13 39 ±10%
2 7 4 3 3 4 4 3
50L6GT 12BA6 12BE6 12AT6
R10 1000
110V.
R9 22 W.W.
C15 20 MFD.
C16 60 MFD.
USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT.
IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.
I.F. FREQUENCY 455 KC.
TUNING RANGE 535 — 1620 K.C.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
DENOTES COMMON RETURN B-
U1
105-15
ON DUAL CAPACITORS LEADS LINE UP ACCORDING TO THE PART NUMBER AS SHOWN.
OSC. COIL

MODELS 6D014—6D029
CHASSIS No. 6C01

PARTS LIST

PART NO.	DIAL ASSEMBLY	PRICE
26-323	Dial Scale	.36
78-380	Tuning Control Shaft	.29
78-453	Dial Light Socket and Wire	.43
80-209	Dial Cord Tension Spring	.03
80-471	Tuning Shaft Spring	1.31C
100-90	Dial Light Bulb	.13
188-32	Retaining Ring (Tuning Con. Shaft)	1.03C
188-34	Retaining Ring (Pointer Pulley)	1.20C
11S9733	Dial Cord and Eyelet Assem. (Short)	.07
61S9751	Pulley and Rivet Assem. (on gang)	.12
59S10944	Pointer and Pulley Assem. (59-147)	.49
11S11128	Dial Cord and Eyelet Assem. (Long)	.07
	COILS AND CHOKES	
95-958	2nd. I. F. Transformer (T2)	2.00
95-960	1st. I. F. Transformer (T1)	2.10
20S12877	Detector Coil Assem. (L2)	.48
20S9578	Oscillator Coil Assem. (L3)	.49
	CONDENSERS	
22-196	.01 Mfd. (C16) ... 600 V.	.20
22-827	.01 Mfd. (C4) ... 200 V.	.23
22-829	.05 Mfd. (C3) ... 200 V.	.20
22-854	.0005 Mfd. (C13) ... 600 V.	.20
22-1017	.05 Mfd. (C6) ... 200 V.	.20
22-1358	Three Gang Variable (C1)	4.50
22-1361	.04 Mfd. (C15) ... 200 V.	.20
22-1362	.004 Mfd. (C14) ... 600 V.	.20
22-1379	.02 Mfd. (C17) ... 400 V.	.20
22-1381	Dry Electrolytic 40-40-40 Mfd. - 150 V. (Alternate for 22-1519)	1.71
22-1519 or 22-1551	Dry Electrolytic 20-20-40 Mfd. - 150 V. ((C18, 19 and 20) ..	1.55
	RESISTORS	
63-579	220 Ohm (R2) ... 1/4 Watt	.09
63-590	15M Ohm (R1) ... 1/4 Watt	.09
63-591	22M Ohm (R3) ... 1/4 Watt	.09
63-597	470M Ohm (R8) ... 1/4 Watt	.09
63-600	2.2 Megohm (R5) ... 1/4 Watt	.09
63-644	22M Ohm (R7) ... 1/4 Watt	.09
63-777	390M Ohm (R10) ... 1/4 Watt Insl.	.19
63-780	680M Ohm (Replaces R10 when a 49-549CS Speaker is used) ...	
63-978	15 Megohm (R4) ... 1/4 Watt	.09
63-1222	470 Ohm W.W. (R12) ... 1 Watt Insl. (10%)	.24
63-886	150 Ohm W.W. (R9) ... 1/2 Watt	.21
63-1335	Volume Control and Sw. (R6)	1.81
63-1449	470 Ohm W.W. (R13) ... 1 Watt Insl.	.24
63-1450	22 Ohm W.W. (R11) ... 1 Watt Insl.	.24
	MISCELLANEOUS	
2-99	Cabinet Back (6D014 and 014Y)	.13
2-99W	Cabinet Back (6D014W)	.13
2-103	Cabinet Back (6D029 and 029G)	.11
11-80	Line Cord and Plug	.65
12-1040	Handle Bracket	.02
14-914	Model 014 Bakelite Cabinet (Walnut)	5.90
14-914W	Model 014W Bakelite Cabinet (White)	7.00
14-914Y	Model 014Y Bakelite Cabinet (Ebony)	7.00
49-549	5" P.M. Speaker	8.00
	206-549 Output Transformer	1.97
	208-549 Cone and Voice Coil	1.73
57-1020	Dial Window Escutcheon (6D029 and 029G)	1.50
78-229	Socket - Electrolytic Cond.	.03
78-401	Socket - Loktal (8 contact)	.19
78-611	Socket - Octal (8 contact)	.12
93-258	Brown Felt Washer (6D029 and 029G)	.78C
110-122	Grille Cloth	.23
112-273	# 8 x 3/4" Oval R. H. S. M. Screw (Chassis Mtg. 014)	.96C
114-134	# 8 x 11/16" Hex Slotted Washer Hd. S. T. Screw (Chassis Mtg. 029).	1.20C
126-379	Tube Shield	.07
139-55	Baffle Board (6D029 and 029G)	.35
159-42	Back Retaining Button	.02
192-79	Dial Crystal (6D029 and 029G)	.45
192-80	Dial Crystal (6D014 and 014Y) (White lettering)	2.00
192-102	Dial Crystal (6D014W) (Black lettering)	2.00
196-62	Dial Crystal Gasket (6D029 and 029G)	.10
208-379	Instruction Book	.07
S11124	Wavemagnet Assem. (Type #28) (L1)	.75
MAS11435	Cabinet Handle and Stud Assem. (36-26)	.48
46S11558	Volume and Tuning Control Knob (46-520)	.28

PRICES SUBJECT TO CHANGE WITHOUT NOTICE 15M 2-22-47



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

Chassis 6C01 features a high gain tuned R. F. circuit ahead of a conventional superheterodyne, with feedback in the audio circuit, and a new filter circuit to reduce hum to a minimum.

Part of the audio voltage from the voice coil is fed back to the first audio grid (12SQ7) in phase through resistor R10 and R7 to a tap on the volume control R6. Capacitor C15 bypasses highs to ground. One side of the output transformer secondary is grounded. The side grounded determines the phase relationship of the feedback voltage, therefore, when replacing the output transformer be certain the proper end of the secondary is grounded or degeneration will result. The overall result of this arrangement is to boost the bass tones.

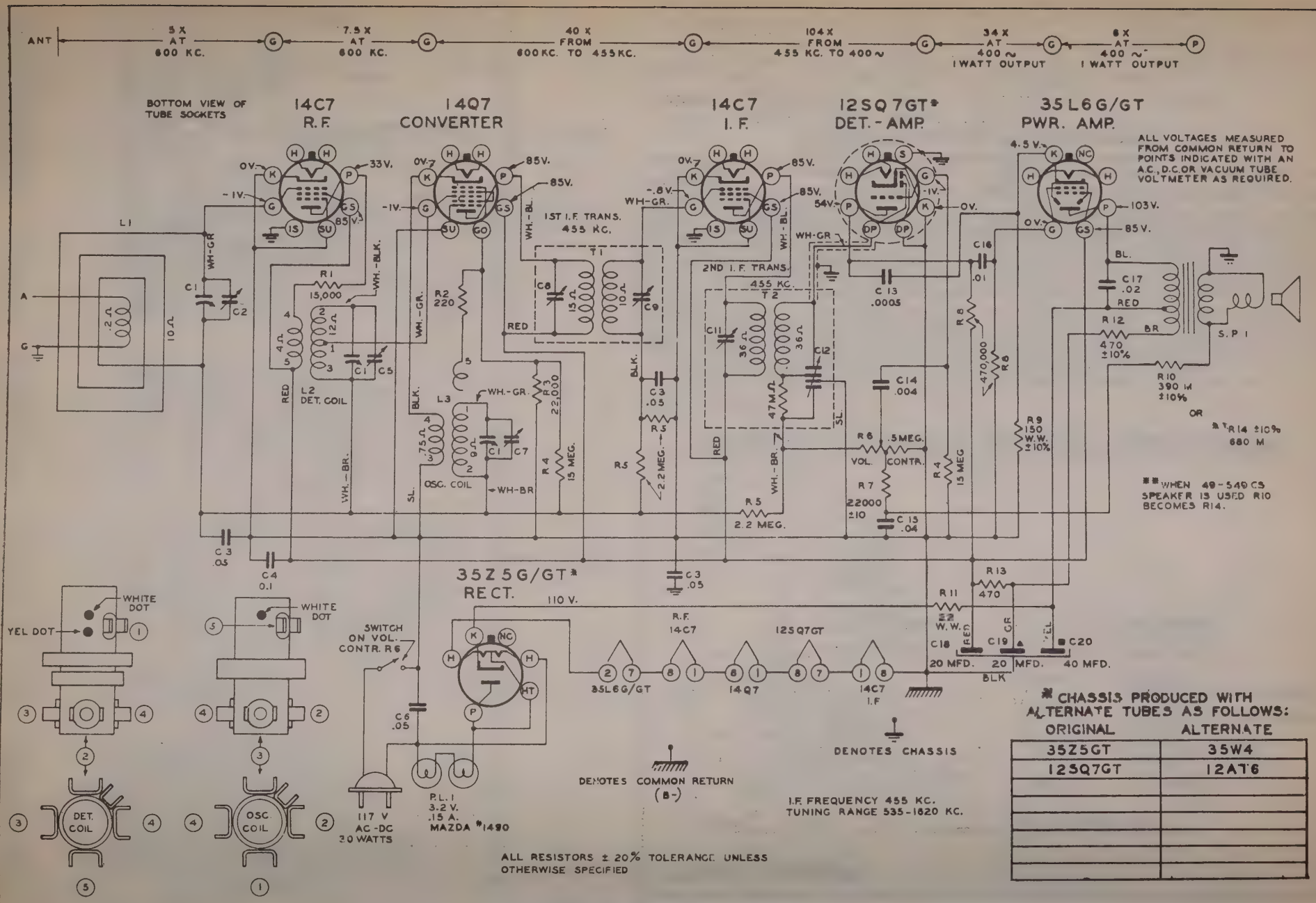
The filter circuits of chassis 6C01 incorporate new features that should be well understood by the service man. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter resistor R11 and capacitor C20 off the cathode of the rectifier 35Z5 to the 35L6 plate. The lower connection of the output transformer feeds B + to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 35L6 produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistors R12 and R13 and capacitors C18 and C19.

This development in filtering systems allows a higher effective plate voltage on the 35L6 for increased power output.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 206-549 be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

ALIGNMENT PROCEDURE

OPERATOR	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-8, C-9 C11, C-12	Align I. F.
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-7	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-5	Align detector
4		--	1400 Kc.	1400 Kc.	C-2	Align antenna stage


ANT
5 X AT 600 KC.
7.5 X AT 600 KC.
40 X FROM 600 KC. TO 455 KC.
104 X FROM 455 KC. TO 400 ~
34 X AT 400 ~ 1 WATT OUTPUT
6 X AT 400 ~ 1 WATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS
14C7 R.F.
14Q7 CONVERTER
14C7 I. F.
12SQ7GT* DET.-AMP.
35L6G/GT PWR. AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
1ST I.F. TRANS. 455 KC.
2ND I.F. TRANS. 455 KC.
L1
L2 DET. COIL
L3
OSC. COIL
T1
T2
S.P 1
R1 15,000
R2 220
R3 22,000
R4 15 MEG.
R5 2.2 MEG.
R6 .5 MEG. VOL. CONTR.
R7 22000 ±10
R8 470,000
R9 150 W.W. ±10%
R10 390 M ±10%
OR
R14 ±10% 680 M
R12 470 ±10%
R13 470
R11 22 W.W.
C1 C2 C3 .05 C4 0.1 C5 C6 .05 C7 C8 C9 C10 C11 C12 C13 .0005 C14 .004 C15 .04 C16 .01 C17 .02
C18 20 MFD. C19 20 MFD. C20 40 MFD.
35Z5G/GT* RECT.
110 V.
SWITCH ON VOL. CONTR. R6
P.L. 1 3.2 V. .15 A. MAZDA #1490
117 V AC-DC 30 WATTS
WHITE DOT
YEL DOT
DET. COIL
OSC. COIL
DENOTES COMMON RETURN (B-)
DENOTES CHASSIS
I.F FREQUENCY 455 KC.
TUNING RANGE 535-1620 KC.
ALL RESISTORS ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED
■■ WHEN 49-540 CS SPEAKER IS USED R10 BECOMES R14.
* CHASSIS PRODUCED WITH ALTERNATE TUBES AS FOLLOWS:
ORIGINAL
ALTERNATE
35Z5GT
35W4
12SQ7GT
12AT6

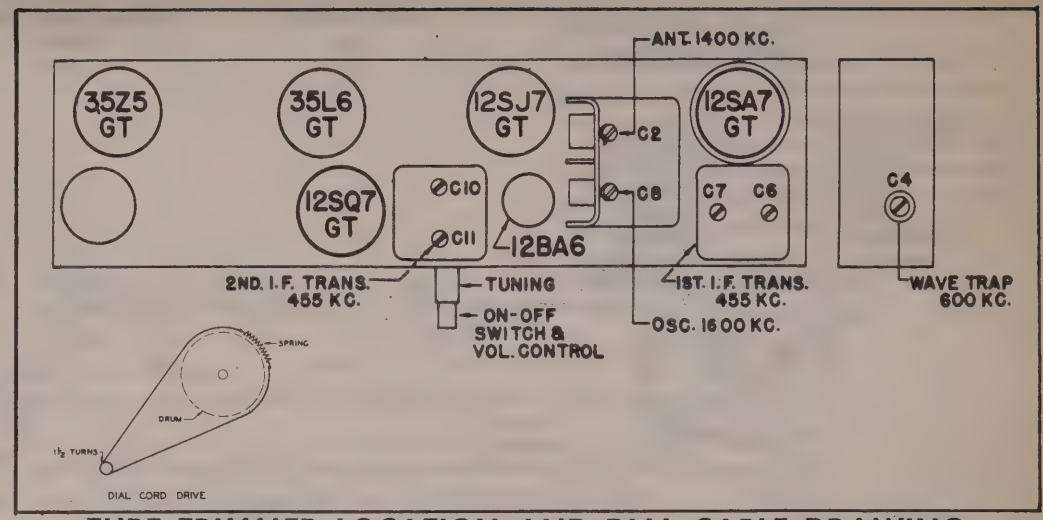
MODELS 6D014—6D029

CHASSIS No. 6C01

PARTS LIST

PART NO.	DIAL ASSEMBLY			PRICE
26-346	Dial Scale			.14
26-365	Dial Scale (Z Models only)			.15
57-1091	Dial Plate			.48
59-164	Dial Pointer			.19
76-407	Tuning Control Shaft			.15
78-325	Dial Light Socket and Wire			.24
80-365	Tuning Shaft Tension Spring			.03
80-508	Dial Cord Tension Spring			.04
100-67	Dial Light Bulb			.10
188-53	Retaining Ring Tuning Shaft			.01
11S11137	Dial Cord and Eyelet Assem.			.09
61S12857	Pulley and Bushing Assem.			.61
	COILS AND CHOKES			
95-929	1st. I. F. Transformer (T1)			1.75
95-930	2nd. I. F. Transformer (T2)			1.73
20S8326	Wave Trap Coil Assem. (L2)			.28
20S11136	Oscillator Coil Assem. (L3)			.58
20S12491	Oscillator Coil Assem. (Z Models only) (L3)			.82
	CONDENSERS			
22-162	.0001 Mfd. (C3)	600 V.		.20
22-196	.01 Mfd. (C15)	600 V.		.20
22-492	.002 Mfd. (C13)	600 V.		.20
22-827	.1 Mfd. (C21)	200 V.		.20
22-829	.05 Mfd. (C5)	200 V.		.20
22-854	.0005 Mfd. (C14)	600 V.		.20
22-953	.0002 Mfd. (C12)	600 V.		.16
22-1015	Wave Trap Trimmer (or 22-1388) (C4)			.20
22-1017	.05 Mfd. (C9)	200 V.		.20
22-1049	.03 Mfd. (C16)	400 V.		.20
22-1202	.04 Mfd. (C20)	200 V.		.20
22-1381	Dry Electrolytic 40 - 40 - 40 Mfd. -	150 V. (Alternate for 22-1519).		1.71
22-1419	Two Gang Variable (C1)			3.45
22-1519 or 22-1551	Dry Electrolytic 40 - 20 - 20 Mfd. -	150 V. (C17, 18 and 19)		1.55
22-1527	Two Gang Variable (Replaces 22-1521) (Z Models only) (C1)			3.45
	RESISTORS			
63-583	1000 Ohm (R3)	1/4 Watt		.09
63-589	10M Ohm (R1)	1/4 Watt		.09
63-591	22M Ohm (R2)	1/4 Watt		.09
63-597	470M Ohm (R7)	1/4 Watt		.09
63-600	2.2 Megohm (R5)	1/4 Watt		.09
63-641	10M Ohm (R9)	1/4 Watt		.09
63-686	150 Ohm W. W. (R8)	1/2 Watt	Insl.	.21
63-976	15 Megohm (R4)	1/4 Watt		.09
63-1222	470 Ohm W. W. (R12)	1 Watt	Insl. 10%	.24
63-1337	Volume Control and Switch (R6)			1.81
63-1449	470 Ohm W. W. (R10)	1 Watt	Insl.	.24
63-1450	22 Ohm W. W. (R11)	1 Watt	Insl.	.24
	MISCELLANEOUS			
2-109	Cabinet Back (6D015 - 015Y)			.11
2-109W	Cabinet Back (6D015W)			.14
2-113	Cabinet Back (6D030)			.14
2-113W	Cabinet Back (6D030W)			.14
11-79	Line Cord and Plug			.65
12-1040	Cabinet Handle Retaining Brkt. (2 used)			.02
14-915	Model 015 Bakelite Cabinet (Walnut)			5.38
14-915W	Model 015W Bakelite Cabinet (White)			7.98
14-915Y	Model 015Y Bakelite Cabinet (Ebony)			7.98
46-529	Tuning Control Knob			.07
46-530	Volume Control Knob			.07
49-547	4" P. M. Speaker			7.00
	206-547 Output Transformer			1.67
	206-547 Cone and Voice Coil			1.73
57-1087	Escutcheon			1.75
57-1152	Escutcheon (6D030)			1.85
78-229	Socket - Electrolytic Cond.			.03
78-373	Socket - Octal (5 contact)			.12
78-376	Socket - Octal (8 contact)			.12
78-439	Socket - Miniature			.12
78-611	Socket - Octal (8 contact)			.12
80-372	Tube Retaining Spring			.10
83-1180	Red Acetate Indicator Strip			.03
110-111	Grille Cloth			.12
112-284	# 8 x 1" Oval B. H. S. T. Screw (Chassis Mtg.)			.02
114-248	# 6 - 20 x 5/16 Hex Hd. S. T. Screw (Handle Brkt. Mtg.)			.01
126-379	Tube Shield			.07
139-59	Speaker Baffle			.09
159-50	Snap Button (Dial Crystal Mtg.)			.01
192-97	Dial Crystal (6D030)			.13
192-109	Dial Crystal (6D015)			.42
196-72	Dial Crystal Gasket			.04
202-392	Instruction Book			.05
S11099	Wavemagnet Assem. (Type # 26) (L1)			1.08
76S12344	Cabinet Handle and Stud Assem. (36-33)			.62
S12486	Wavemagnet Assem. (Type # 26C) (Z Models only) (L1)			1.06

PRICES SUBJECT TO CHANGE WITHOUT NOTICE 15M 2-22-47



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

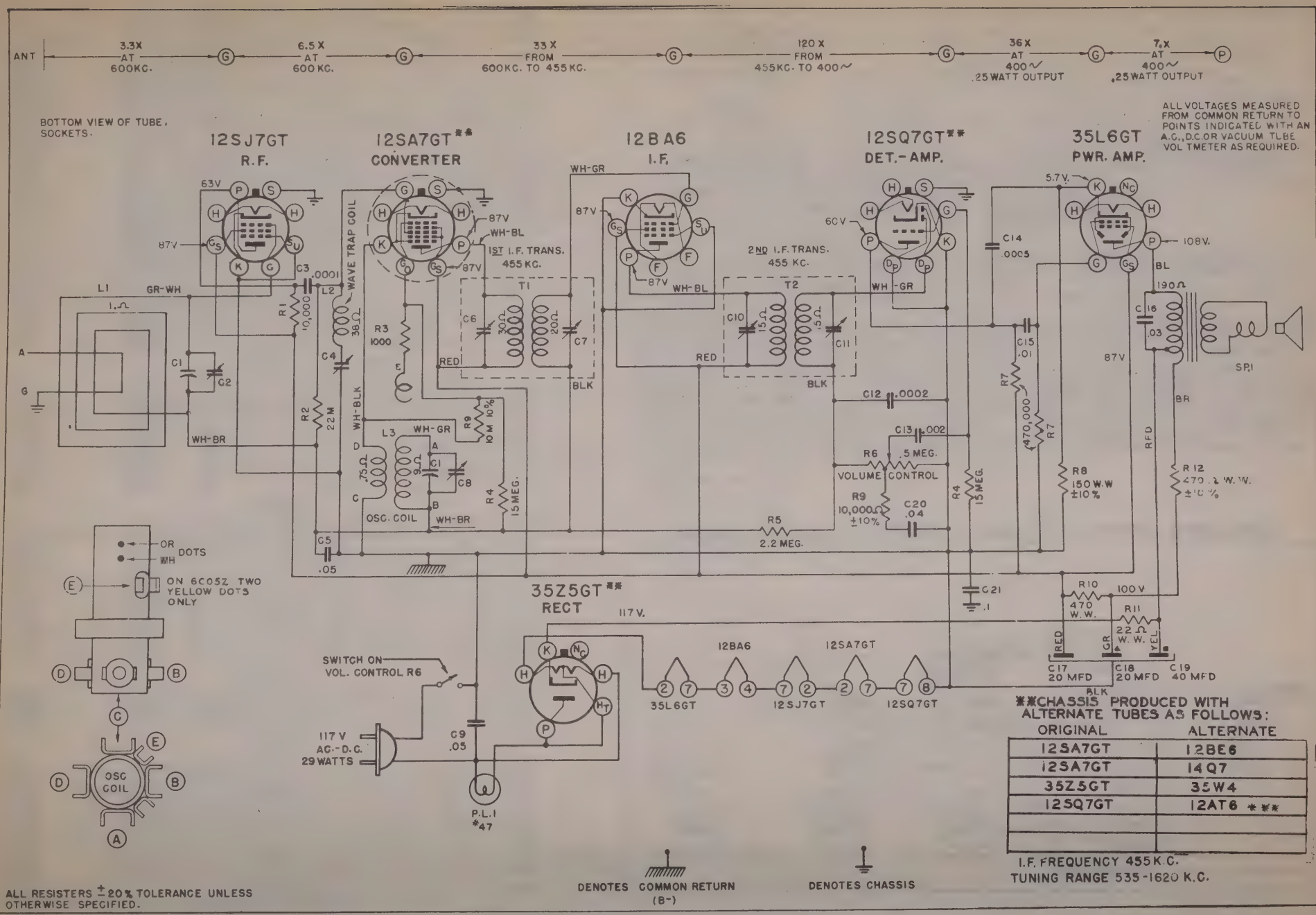
The filter circuits of chassis 6C05 incorporate new features that should be well understood by the service man. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter resistor R11 and capacitor C19 off the cathode of the rectifier 35Z5 to the 35L6 plate. The lower connection of the output transformer feeds B + to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 35L6 produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistor R10 and 12 and capacitors C17 and 18.

This development in filtering systems allows a higher effective plate voltage on the 35L6 for increased power output.

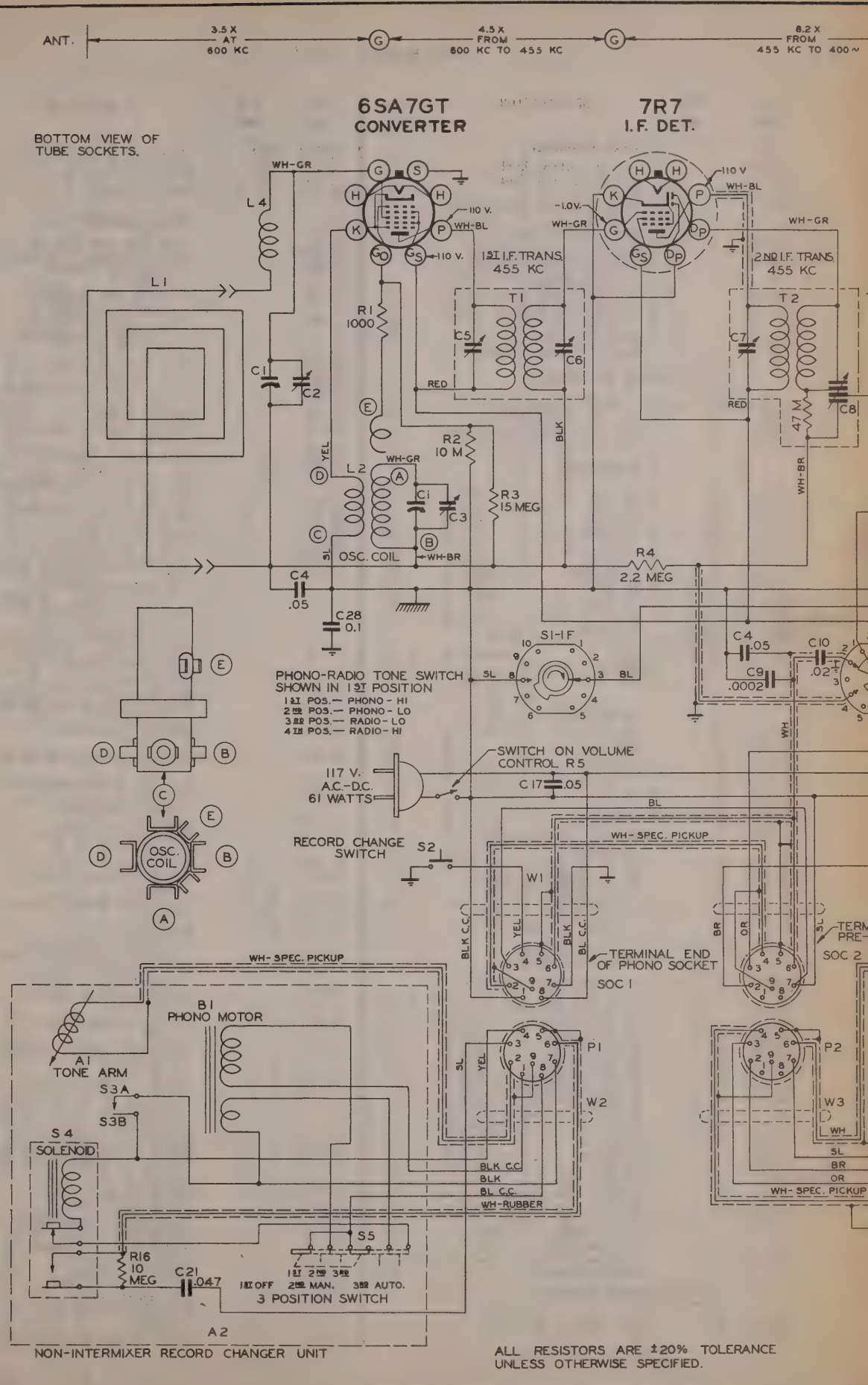
NOTE: The output transformer must be replaced with an exact duplicate, Part No. 206-547. Be sure to add the speaker code letter to the transformer Part Number.

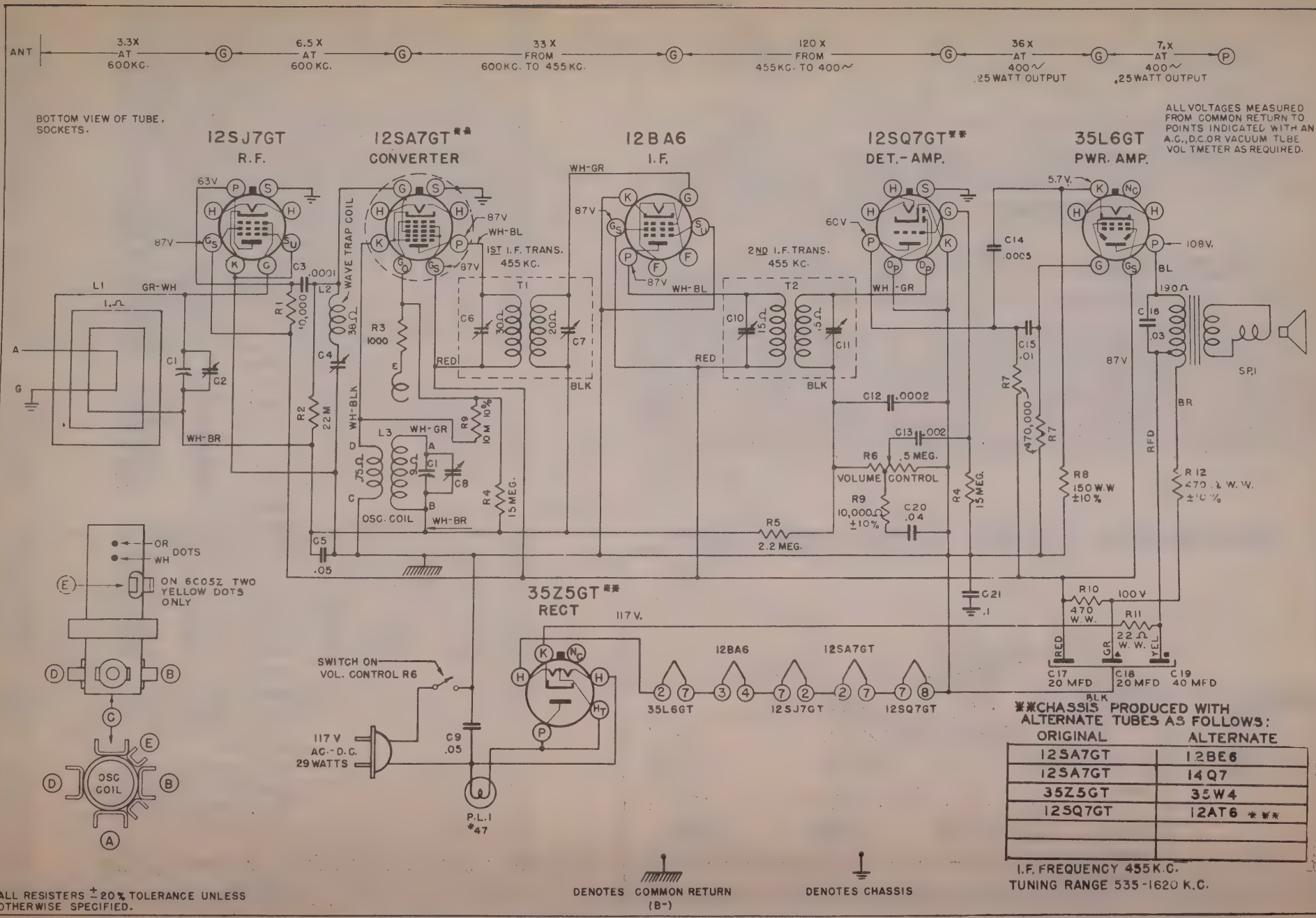
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd.	455 Kc.	600 Kc.	C-6, C-7, C-10, C-11	I. F. Alignment
2	Single Turn Loosely Coupled to Wave Magnet	--	455 Kc.	600 Kc.	C-4	Adjust Wave Trap to minimum.
3		--	1600 Kc.	1600 Kc.	C-8	Set Oscillator to Dial Scale.
4		--	1400 Kc.	1400 Kc.	C-2	Antenna Alignment


ANT
3.3X AT 600KC.
6.5 X AT 600 KC.
33 X FROM 600KC. TO 455 KC.
120 X FROM 455KC. TO 400~
36X AT 400~ .25 WATT OUTPUT
7.x AT 400~ .25 WATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
12SJ7GT R.F.
12SA7GT** CONVERTER
12BA6 I.F.
12SQ7GT** DET.-AMP.
35L6GT PWR. AMP.
35Z5GT** RECT
1ST I.F. TRANS. 455 KC.
2ND I.F. TRANS. 455 KC.
WAVE TRAP COIL
OSC. COIL
VOLUME CONTROL
SP.1
P.L.1 #47
SWITCH ON VOL. CONTROL R6
117 V AC.-D.C. 29 WATTS
OR WH DOTS
ON 6C05Z TWO YELLOW DOTS ONLY
OSC COIL
ALL RESISTERS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES COMMON RETURN (B-)
DENOTES CHASSIS
**CHASSIS PRODUCED WITH ALTERNATE TUBES AS FOLLOWS:
ORIGINAL | ALTERNATE
12SA7GT | 12BE6
12SA7GT | 14Q7
35Z5GT | 35W4
12SQ7GT | 12AT6 ***
I.F. FREQUENCY 455 K.C.
TUNING RANGE 535-1620 K.C.

MODELS 6D015—6D030—6D015Z—6D030Z


ANT.
3.5 X AT 600 KC
4.5 X FROM 600 KC TO 455 KC
8.2 X FROM 455 KC TO 400 ~
6SA7GT
CONVERTER
7R7
I.F. DET.
BOTTOM VIEW OF TUBE SOCKETS.
L4
L1
C1
C2
R1 1000
WH-GR
110 V.
WH-BL
-1.0V.
1ST I.F. TRANS. 455 KC
2ND I.F. TRANS. 455 KC
T1
T2
C5
C6
C7
C8
47 M
RED
BLK
WH-BR
R2 10 M
R3 15 MEG
R4 2.2 MEG
L2
C1
C3
OSC. COIL
YEL
SL
C4 .05
C28 0.1
C9 .0002
C10 .02
S1-IF
PHONO-RADIO TONE SWITCH SHOWN IN 1ST POSITION
1ST POS. — PHONO - HI
2ND POS. — PHONO - LO
3RD POS. — RADIO - LO
4TH POS. — RADIO - HI
SWITCH ON VOLUME CONTROL R5
117 V. A.C.-D.C. 61 WATTS
C17 .05
BL
WH
RECORD CHANGE SWITCH
S2
W1
WH-SPEC. PICKUP
BLK C.C.
BL C.C.
TERMINAL END OF PHONO SOCKET
SOC 1
SOC 2
B1 PHONO MOTOR
A1 TONE ARM
S3A
S3B
S4 SOLENOID
P1
P2
W2
W3
BLK
WH-RUBBER
S5
R16 10 MEG
C21 .047
1ST OFF 2ND MAN. 3RD AUTO.
3 POSITION SWITCH
A2
NON-INTERMIXER RECORD CHANGER UNIT
ALL RESISTORS ARE ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.


ANT
3.3X AT 600KC.
6.5 X AT 600 KC.
33 X FROM 600KC. TO 455 KC.
120 X FROM 455KC. TO 400~
36X AT 400~ .25 WATT OUTPUT
7.X AT 400~ .25WATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
12SJ7GT R.F.
12SA7GT** CONVERTER
12BA6 I.F.
12SQ7GT** DET.-AMP.
35L6GT PWR. AMP.
35Z5GT** RECT
1ST I.F. TRANS. 455 KC.
2ND I.F. TRANS. 455 KC.
WAVE TRAP COIL
OSC. COIL
VOLUME CONTROL
SP.1
SWITCH ON VOL. CONTROL R6
117 V AC.-D.C. 29 WATTS
P.L.1 *47
OR WH DOTS
ON 6C05Z TWO YELLOW DOTS ONLY
OSC COIL
ALL RESISTERS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES COMMON RETURN (B-)
DENOTES CHASSIS

****CHASSIS PRODUCED WITH ALTERNATE TUBES AS FOLLOWS:**

ORIGINAL	ALTERNATE
12SA7GT	12BE6
12SA7GT	14Q7
35Z5GT	35W4
12SQ7GT	12AT6 ***

I.F. FREQUENCY 455 K.C.
TUNING RANGE 535-1620 K.C.

MODELS 6D015—6D030—6D015Z—6D030Z

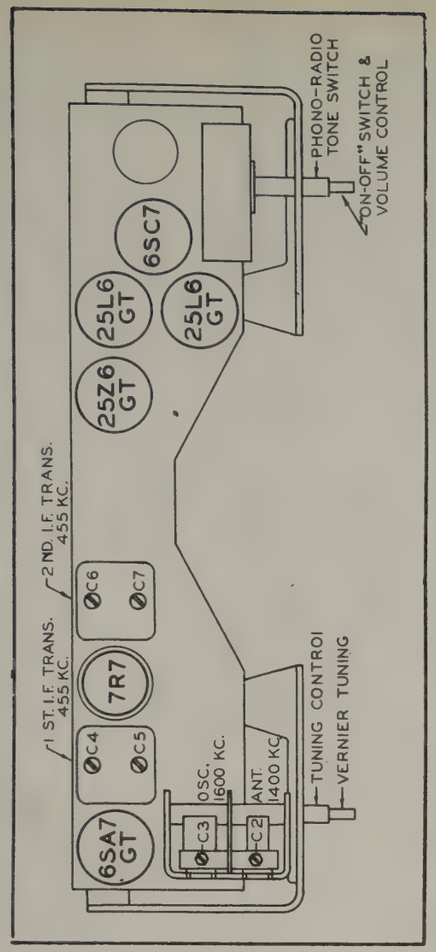
MODEL 7R070
CHASSIS No. 6C06

TO THE SERVICEMAN:

The alignment of chassis 6C06 is conventional. None of the adjustments interlock, however, the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.

TUBE AND TRIMMER LOCATION

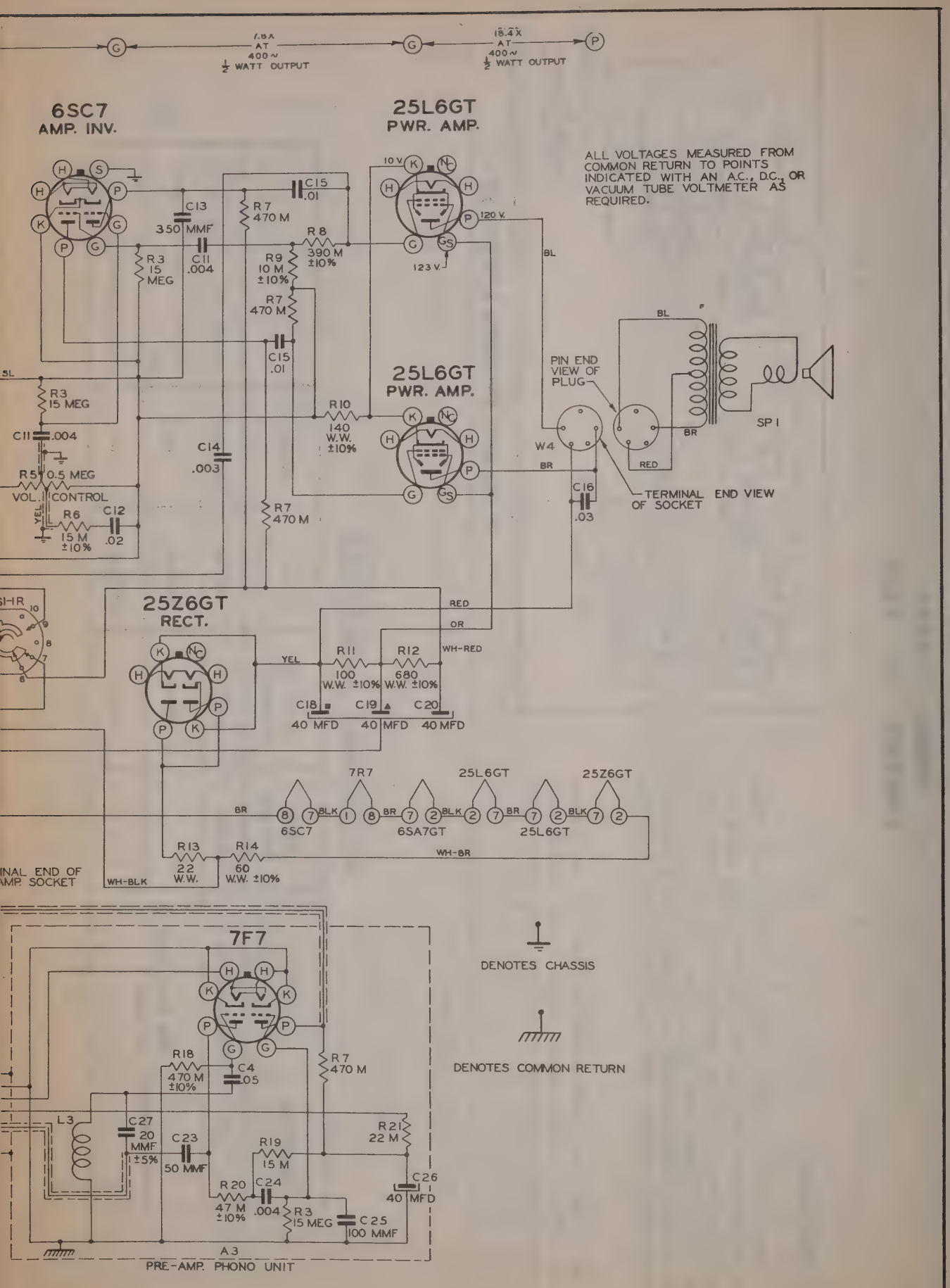


ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 MFD	455 KC	600 KC	C4,5,6,7	Align IF
2	One turn Coupled to Loop		1600 KC	1600 KC	C3	Set Oscillator to Dial Scale
3			1400 KC	1400 KC	C2	Align Antenna

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
46-610		Tuning Control Knob	$0.25
46-611		Volume Control Knob	.45
46-612		Phono-Radio Knob	.25
46-613		Tuning Control Knob (Vernier)	.40
46-614		Phono-Reject Knob	.20
78-582		Socket-Phono (9 Contact)	.20
188-53		Retaining Ring (Used on Volume Control and Phono-Radio Switch)	.01
188-54		Knob Retaining Ring (2 used)	.02
188-93		Knob Retaining Ring (1 used on 46-613)	.02
196-83		Speaker Gasket	.70
S12732		Control Linkage Assembly	.35
		COILS AND CHOKES	
95-970	T1	1st I.F. Transformer	2.00
95-971	T2	2nd I.F. Transformer	2.00
S12389	L4	Antenna Loading Coil Assem.	.25
S12733	L2	Oscillator Coil Assembly	.65
		CONDENSERS	
22-188	C10	.02 Mfd .400 V.	.20
22-196	C15	.01 Mfd .600 V.	.20
22-326	C14	.003 Mfd. .400 V.	.20
22-327	C12	.02 Mfd .200 V.	.20
22-827	C28	.1 Mfd. .200 V.	.23
22-829	C4	.05 Mfd .200 V.	.20
22-953	C9	.0002 Mfd .600 V.	.16
22-954	C13	350 Mmfd. .600 V.	.16
22-1017	C17	.05 Mfd .400 V.	.20
22-1049	C16	.03 Mfd .400 V.	.20
22-1362	C11	.004 Mfd. .600 V.	.20
22-1381	C18,19,20	Electrolytic 40-40-40 Mfd .150 V.	1.71
22-1541	C1	Two Gang Variable	4.00
22-1775	C21	.047 Mfd. .400 V	----
		RESISTORS	
63-311	R6	15M Ohm .1/4 W.	.09
63-583	R1	1000 Ohm. .1/4 W.	.09
63-589	R2	10M Ohm .1/4 W.	.09
63-597	R7	470M Ohm. .1/4 W.	.09
63-600	R4	2.2 Megohm. .1/4 W.	.09
63-641	R9	10M Ohm .1/4 W.	.09
63-658	R8	390M Ohm. .1/4 W.	.09
63-976	R3	15 Megohm .1/4 W.	.09
63-1070	R12	680 Ohm (Wirewound) (Insulated) .1 W.	.24
63-1366	R10	140 Ohm (Zipohm) .2-1/2 W.	.33
63-1474	R5	Volume Control & Switch	1.81
63-1475	R11	100 Ohm (Wirewound) (Insulated) .2 W.	.33
63-1511	R13, R14	Candohm 22 ohm 1 W (WW), 60 Ohm, 7W (WW)	.65
		PRE-AMP PHONO UNIT	
S14605	L3	Oscillator Coil Assembly (FM Phono)	2.02
S13198		Pre-Amp Phono Cable Assem.	1.50
S13201		Pre-Amp Phono Unit (Compl.)	----
22-162	C25	100 Mmfd. .500 V.	.20
22-448	C24	.004 Mfd. .600 V.	.20
22-829	C4	.05 Mfd .200 V.	.20
22-1532	C23	50 Mmfd (Mica) .500 V.	.20
22-1610	C26	40 Mfd. Electrolytic .150 V.	1.50
22-1673	C27	20 Mmfd. (Ceramic) .500 V.	.25
58-133	P1, P2	Phono Plug (Used on S13198)	.12
63-591	R21	22M Ohm .1/4 W.	.09
63-597	R7	470M Ohm. .1/4 W.	.09
63-604	R16	10 Megohm .1/4 W.	.09
63-648	R20	47M Ohm .1/4 W.	.09
63-659	R18	470M Ohm. .1/4 W.	.09
63-710	R19	15M Ohm (Insulated) .1/4 W.	.19
63-976	R3	15 Megohm .1/4 W.	.09
78-229		Electrolytic Socket	.03
78-401		Tube Socket (or 78-596) (8 contact)	.19
80-469		Mounting Spring (3 used)	.02
126-523		Chassis Shield	.60
		RECORD CHANGER	
141-104	B1	Phono Motor, 60 Cycle	7.50
S12575	S3A	Trip Contact Assembly	----
S12579	S3B	Insulator Strip Assembly	$----
S11458	S4	Solenoid	----
85-372	S5	3 Position Switch	----
78-582	Soc 1, 2	Phono Socket	----
		MISCELLANEOUS	
11-87		Line Cord and Plug (8 ft.)	.65
12-1350		Line Cord Support Bracket	.15
15-65		Plug Shield (used on S12734)	.27
15-67		Plug Cap and Insulator (used on S12734)	.08
17-86		Record Locking Clamp. (2 - 17-86 must be used with 188-99)	.15
19-99		Coil Mounting Clip	.03
19-123		Phono Mounting Clip	.10
24-392		Volume Control and Switch Cover	.15
36-34		Cabinet Handle	1.40
36-35		Cabinet Handle Insert for 36-34	1.50
40-38		Cabinet Lid Support	.85
49-559	SP1	6½" P.M. Speaker	10.00
		206-559 Output Transformer	2.21
		208-559 Cone and Voice Coil	2.09
52-372		Speaker Socket and Cable	.65
54-245		#8-32 Speed Nut	.03
57-1195		Ventilation Plate	1.00
57-1196		Front Panel (Plastic)	6.00
57-1197		Chassis Front Plate	.45
70-133		#6 x 3/8" Phillips R. H. Wood Screw - Steel - Statuary Bronze (5 used)	.01
72-68		#4 x 1/2" Phillips F. H. Wood Screw (8 used) (Front Panel Mtg. Screw)	.02
72-69		#6 x 3/4" Flat Hd. W. Screw (10 used) Steel - Black Oxidize	.01
78-229		Socket - Electrolytic Cond.	.024
78-401		Socket - Loktal (or 78-596) (8 contact)	.19
78-611		Socket - Tube (Octal - 8 contact)	.12
80-512		Phono Unit Mounting Spring (Top) (4 used)	.03
80-541		Tone Arm Retaining Spring	.10
83-1228		Pin Jack Terminal Strip (Gang Condenser)	.10
83-1347		Handle Name Strip	.90
83-1350		Insulating Strip (for 63-1511)	.04
83-1491		Felt Strip	.01
84-66		Record Locking Clamp Support	.15
85-388	S1	4 Position Switch (Phono-Radio)	1.00
85-389	S2	Reject Switch	.30
93-125		#6 Internal Shakeproof Lockwasher #1206 (7 used)	.31C
93-127		#10 Internal Shakeproof Lockwasher (4 used)	.43C
93-833		Shoulder Washer (Rubber) (4 used)	.10
93-853		#6 Countersunk Washer (10 used)	.03
94-295		Condenser Mounting Bushing (3 used)	.04
110-120		Grille Cloth	.20
112-187		#10-32 x 1-1/4" Phillips Oval Hd. M. Screw, Steel - Bronze (4 used) (Chassis Mtg.)	.03
112-544		Phono Unit Mounting Screw	.11
114-265		#10-32 x 1-1/4" Slotted Hex Acorn Hd. M.S. - N.P. (4 used) (Handle Mtg.)	.05
125-54		Rubber Grommet	.02
126-379		Tube Shield (7R7)	.07
156-22		Cover Latch (Upper Half)	.87
156-23		Cover Latch (Lower Half)	.87
166-40		Recess Bumper (4 used)	.03
188-99		Clamp Ring	.60
202-450		Instruction Book	.20
S12734	W1	Phono Cable Assembly	1.15
S12740	L1	Wavemagnet Assem. - Type 29C	1.25
S13200		Non-Intermixer Record Changer	----
S13270		Handle & Name Strip Assem.	3.80



MODEL 7R070
CHASSIS No. 6606

PART NO.	REF. NO.	DESCRIPTION	PRICE
		MISCELLANEOUS	
2-122		Cabinet Back	$ 0.30
11-104		Line Cord and Plug (7 Ft.)	.65
46-687		Tuning Control Knob (2 used)	.10
46-689		Phono Switch Knob (2 used)	.10
49-602	SP1	5-3/4" P. M. Speaker	4.75
208-602		Cone and Voice Coil	1.73
54-228		Speed Nut - Tinnerman #109-3/4 (26-387)	.75C
57-1319		Escutcheon	4.80
57-1320		Chassis Cover Plate	.75
70-128		#5 x 3/8" Washer Hd. Wood Screw Steel Stationary Bronze	.01
72-74		#4 x 3/8" Phillips Flat H. W. S. Steel Brass Plate (Escutcheon Mtg.)	.02
78-274		Socket Electrolytic Capacitor	.03
78-436		Socket Miniature Tube	.19
78-755		Socket Octal Base Tube	.18
78-792	P1	Socket Phono (5 contact)	.15
78-794		Socket Miniature Tube	.20
78-795		Socket Miniature Tube (2 used)	.20
85-421	S1	Phono Radio Switch	.90
85-422	S2	Reject Switch	.40
93-721		Felt Washer	.01
95-1025	T3	Output Transformer	1.65
110-129		Grille Cloth	.25
114-128		#10 x 1-1/16" Hex Washer Hd. S. T. Screw Type Z Cad. Pl. (2 used)	1.81C
114-291		#8-32 x 7/16" Hex Hd. Slotted M. S. Steel N. P	.85C
125-17		Rubber Grommet (5 used)	.03
125-39		Rubber Grommet (2 used)	.02
126-553		Tube Shield	.11
139-71		Speaker Baffle	.40
166-13		Rubber Bumper (2 used)	.03
166-20		Tack Bumper (4 used)	.03
166-44		Rubber Bumper	.02
202-528		Instruction Book	.06
S-13815		Hinge Assembly	1.50
S-13817	L1	Wavemagnet Assembly Type 26F	1.25
		RECORD CHANGER MTG. PARTS	
19-123		Record Changer Mounting Clip	.10
80-407		Record Changer Mounting Spring (4 used)	.02
112-544		Record Changer Mounting Screw (2 used)	.11
S-14001		Non-Intermixer Record Changer	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL 6R886
CHASSIS No. 6E02

ANT. — 3.5 X AT 600 KC — G — 4.5 X FROM 600 KC TO 455 KC — G — 8.2 X FROM 455 KC TO 400 ~ — G — 1.8 A AT 400 ~ ½ WATT OUTPUT — G — 18.4 X AT 400 ~ ½ WATT OUTPUT — P

BOTTOM VIEW OF TUBE SOCKETS.

6SA7GT CONVERTER

7R7 I.F. DET.

6SC7 AMP. INV.

25L6GT PWR. AMP.

25L6GT PWR. AMP.

25Z6GT RECT.

7F7

ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C., OR VACUUM TUBE VOLTMETER AS REQUIRED.

L1 L2 L4 C1 C2 C3 C4 .05 C28 0.1 R1 1000 R2 10 M R3 15 MEG R4 2.2 MEG OSC. COIL

1ST I.F. TRANS. 455 KC T1 C5 C6

2ND I.F. TRANS. 455 KC T2 C7 C8 47 M

R3 15 MEG C11 .004 R5 0.5 MEG VOL. CONTROL R6 15 M ±10% C12 .02 C14 .003

C13 350 MMF C11 .004 R7 470 M C15 .01 R8 390 M ±10% R9 10 M ±10% R10 140 W.W. ±10%

C16 .03

PIN END VIEW OF PLUG — TERMINAL END VIEW OF SOCKET — SP 1

PHONO-RADIO TONE SWITCH SHOWN IN 1ST POSITION
1ST POS.— PHONO - HI
2ND POS.— PHONO - LO
3RD POS.— RADIO - LO
4TH POS.— RADIO - HI

S1-1F S1-1R C4 .05 C10 .02 C9 .0002

SWITCH ON VOLUME CONTROL R5 — 117 V. A.C.-D.C. 61 WATTS — C17 .05

RECORD CHANGE SWITCH S2

W1 — TERMINAL END OF PHONO SOCKET — SOC 1 — TERMINAL END OF PRE-AMP. SOCKET — SOC 2

R11 100 W.W. ±10% R12 680 W.W. ±10% R13 22 W.W. R14 60 W.W. ±10%

C18 40 MFD C19 40 MFD C20 40 MFD

7R7 — 6SC7 — 6SA7GT — 25L6GT — 25L6GT — 25Z6GT

WH-SPEC. PICKUP

B1 PHONO MOTOR A1 TONE ARM S3A S3B S4 SOLENOID S5 3 POSITION SWITCH 1ST OFF 2ND MAN. 3RD AUTO. R16 10 MEG C21 .047

P1 P2 W2 W3

A2 NON-INTERMIXER RECORD CHANGER UNIT

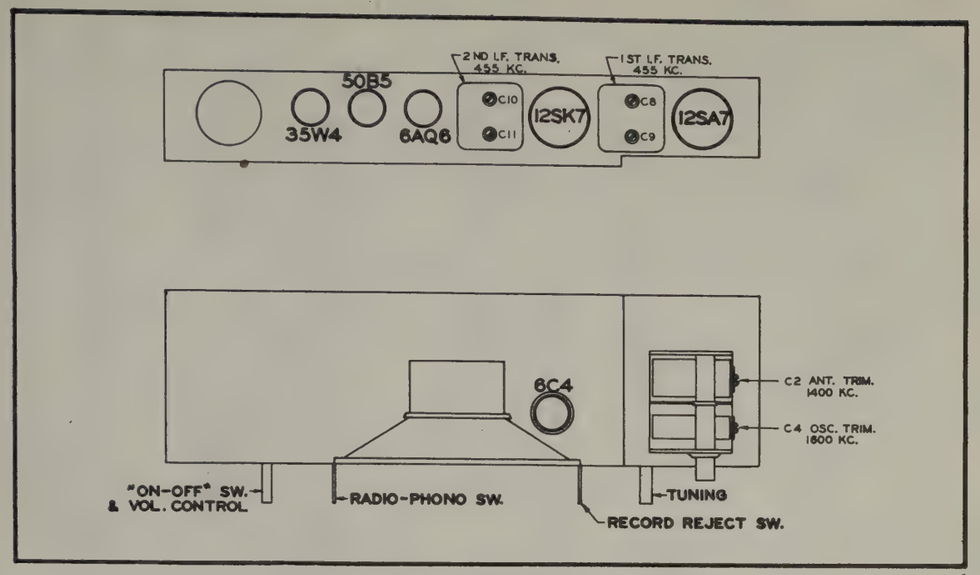
R18 470 M ±10% C4 .05 R7 470 M L3 C27 20 MMF ±5% C23 50 MMF R19 15 M R20 47 M ±10% C24 .004 R3 15 MEG C25 100 MMF R21 22 M C26 40 MFD

A3 PRE-AMP. PHONO UNIT

DENOTES CHASSIS

DENOTES COMMON RETURN

ALL RESISTORS ARE ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.



TUBE AND TRIMMER LOCATION

TO THE SERVICEMAN:

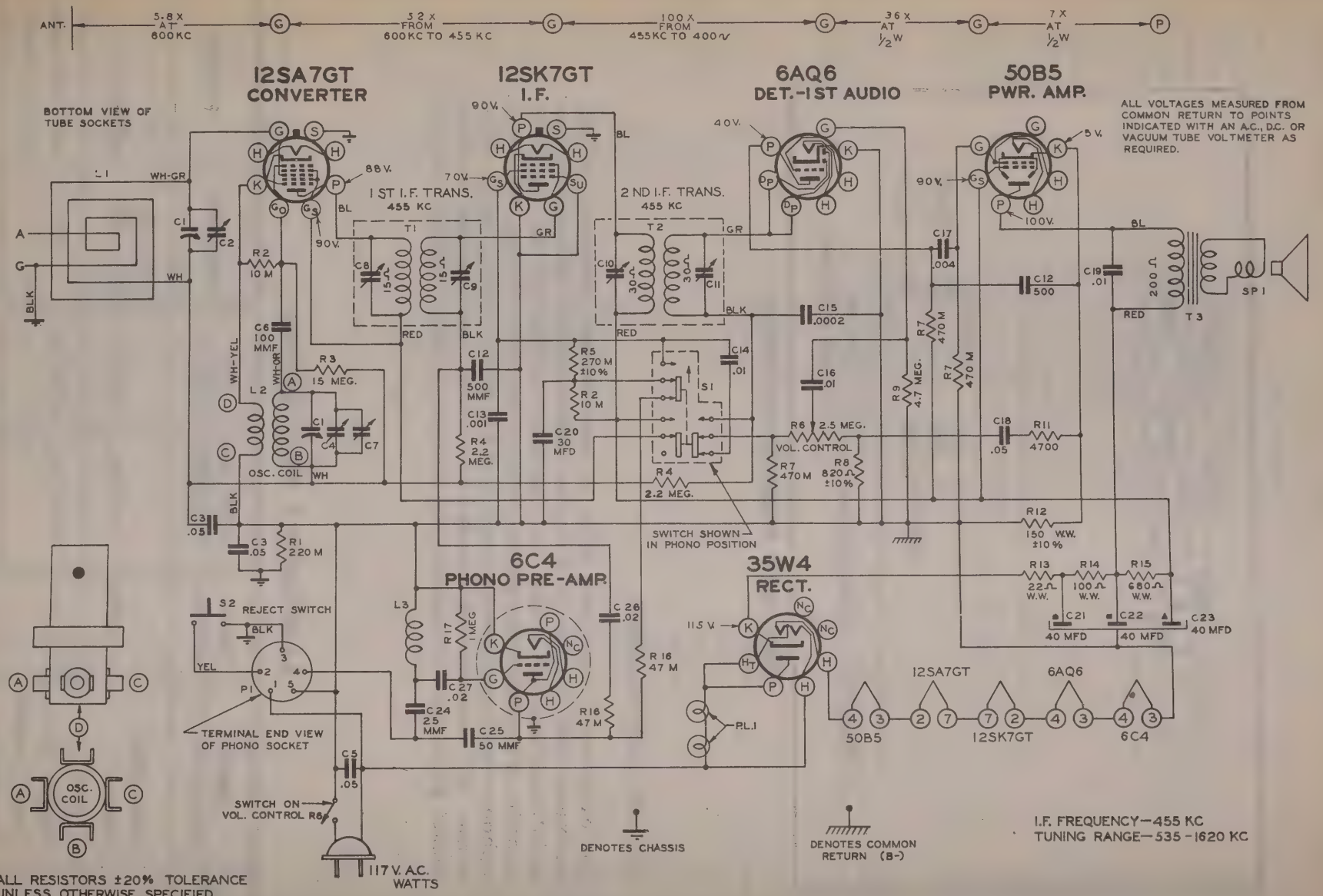
The alignment of chassis 6E02 is conventional, however the adjustments interlock to some degree, therefore, the procedure must be followed exactly. Since this chassis is of the AC/DC type, care must be exercised when making measurements. Chassis 6E02 has a phono-radio push button switch of the double acting type. When in the "In" position this connects the radio for playing records. Socket P1 is used to connect the changer to the receiver chassis.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 MFD	455 Kc.	600 Kc.	C8, C9, C10, C11	Align I.F.
2	Single Turn Loop Loosely Coupled to Wavemagnet	-------	1600 Kc.	1600 Kc.	C4	Set Oscillator to Dial Scale.
3		-------	1400 Kc.	1400 Kc.	C2	Align Antenna.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-387		Dial Scale	$0.07
76-492		Tuning Control Shaft	.15
78-769		Dial Light Socket and Wire	.60
80-69		Dial Cord Tension Spring	.01
80-209		Dial Cord Tension Spring	.03
97-284		Dial Cord Guide Stud	.17
100-90	PL1	Dial Light Bulb (2 used)	.11
102-454		Dial Calibration Label	.09
188-32		Retaining Ring (76-492)	1.03C
188-75		Retaining Ring (S13829)	.02
S-13827		Dial Cord Assembly (Short)	.04
S-13828		Dial Cord Assembly (Long)	.05
S-13829		Dial Pointer and Pulley Assembly (59-201)	.30
S-13830		Tuning Pulley and Bushing Assembly	.45
		COILS AND CHOKES	
95-906	T2	2nd I. F. Transformer	1.75
95-919	T1	1st I. F. Transformer	1.80
S-12603	L3	Phono Oscillator Coil Assembly (FM-Phono)	2.02
S-13799	L2	Oscillator Coil Assembly	.75
		CONDENSERS	
22-127	C24	25 MMFD . . . 500 V	.20
22-162	C6	.0001 MFD . . . 500 V	.20
22-178	C18	.05 MFD . . . 200 V	.20
22-188	C26	.02 MFD . . . 400 V	.20
22-196	C16	.01 MFD . . . 600 V	.20
22-243	C14	.01 MFD . . . 400 V	.20
22-327	C27	.02 MFD . . . 200 V	.20
22-448	C17	.004 MFD . . . 600 V	.20
22-716	C12	.0005 MFD . . . 500 V	.26
22-829	C3	.05 MFD . . . 200 V	.20
22-953	C15	.0002 MFD . . . 500 V	.16
22-1017	C5	.05 MFD . . . 400 V	.20
22-1182	C19	.01 MFD . . . 400 V	.20
22-1444	C13	.001 MFD . . . 200 V	.20
22-1532	C25	.50 MMFD . . . 500 V	.20
22-1657	C1	Two Gang Variable	3.00
22-1707	C20, C21, C22, C23	Dry Electrolytic 40-40-40-30 MFD. - 150 V	3.00
		RESISTORS	
63-686	R12	150 Ohm, Insulated . . . 1/2 W	.21
63-1219	R13	22 Ohm, Insulated . . . 1/2 W	.21
63-1220	R14	100 Ohm, Insulated . . . 1 W	.24
63-1221	R15	680 Ohm, Insulated . . . 1 W	.24
63-1555	R6	Volume Control and Switch	1.81
63-1782	R8	820 Ohm, Insulated . . . 1/2 W	.21
63-1814	R11	4700 Ohm, Insulated . . . 1/2 W	.21
63-1828	R2	10M Ohm, Insulated . . . 1/2 W	.21
63-1856	R16	47M Ohm, Insulated . . . 1/2 W	.21
63-1884	R1	220M Ohm, Insulated . . . 1/2 W	.21
63-1887	R5	270M Ohm, Insulated . . . 1/2 W	.21
63-1898	R7	470M Ohm, Insulated . . . 1/2 W	.21
63-1911	R17	1 Megohm, Insulated . . . 1/2 W	.21
63-1926	R4	2.2 Megohm, Insulated . . . 1/2 W	.21
63-1940	R9	4.7 Megohm, Insulated . . . 1/2 W	.21
63-1961	R3	15 Megohm, Insulated . . . 1/2 W	.21


ANT.
5.8 X AT 600 KC
52 X FROM 600 KC TO 455 KC
100 X FROM 455 KC TO 400 V
36 X AT ½ W
7 X AT ½ W
P
12SA7GT CONVERTER
12SK7GT I.F.
6AQ6 DET.-1ST AUDIO
50B5 PWR. AMP.
BOTTOM VIEW OF TUBE SOCKETS
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
1ST I.F. TRANS. 455 KC
2ND I.F. TRANS. 455 KC
OSC. COIL
SWITCH SHOWN IN PHONO POSITION
6C4 PHONO PRE-AMP.
35W4 RECT.
S2 REJECT SWITCH
TERMINAL END VIEW OF PHONO SOCKET
SWITCH ON VOL. CONTROL R6
117 V. A.C. WATTS
VOL. CONTROL
SP 1
T 3
PL 1
DENOTES CHASSIS
DENOTES COMMON RETURN (B-)
I.F. FREQUENCY—455 KC
TUNING RANGE—535 - 1620 KC
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

MODEL 6R886

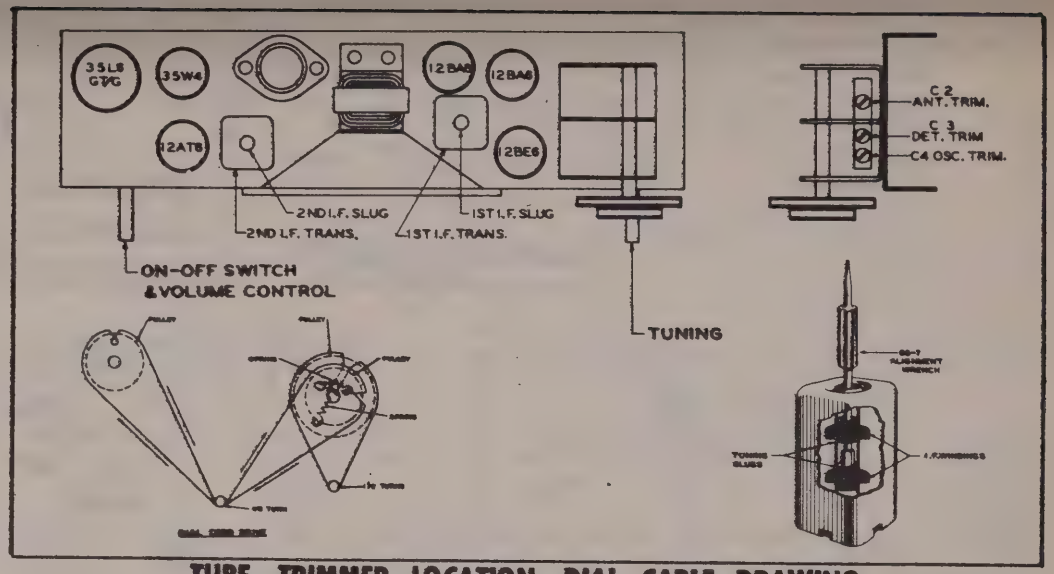
CHASSIS No. 6E02

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-411		Dial Scale	
59-219		Dial Pointer	
76-519		Tuning Shaft	
78-822		Dial Light Socket and Wire	
80-49		Dial Cord Tension Spring	
80-209		Dial Cord Tension Spring	
97-284		Dial Cord Guide Stud	
190-67	PL-1	Dial Light Bulb - 6.3 VC .15 Amp.	
186-32		Retaining Ring	
188-60		Retaining Ring	
S-14834		Dial Cord and Eyelet Assembly (Short)	
S-14866		Dial Cord and Eyelet Assembly (Long)	
S-14867		Pointer Pulley and Bushing Assembly	
S-14868		Pointer Pulley Bracket and Stud Assembly	
		COILS AND CHOKES	
95-1101	T1	1st I. F. Transformer	
95-1102	T2	2nd I. F. Transformer	
S-14832	L2	Detector Coil Assembly	
S-14833	L3	Oscillator Coil Assembly	
		CONDENSERS	
22-178	C-11	.05 MFD ..... 200 V	
22-829	C-5	.05 MFD ..... 200 V	
22-1182	C-12	.01 MFD ..... 400 V	
22-1775	C-13	.047 MFD ..... 400 V	
22-1805	C-1	Three Section Gang	
22-1808	C-14, C-15	Dry Electrolytic 80 x 40 MFD 150 V	
105-14	U-1	Multiple Capacitor Unit	
		RESISTORS	
63-686	R12	150 Ohm W.W. Insulated ..... 1/2 W	
63-1219	R14	22 Ohm W.W. Insulated ..... 1/2 W	
63-1574	R13	1M Ohm Insulated ..... 1 W	
63-1644	R9	Vol. Con. and Switch	
63-1744	R5	100 Ohm Insulated ..... 1/2 W	
63-1745	R1	330 Ohm Insulated ..... 1/2 W	
63-1786	R3	1M Ohm Insulated ..... 1/2 W	
63-1814	R8	4700 Ohm Insulated ..... 1/2 W	
63-1828	R2	10M Ohm Insulated ..... 1/2 W	
63-1842	R4	22M Ohm Insulated ..... 1/2 W	
63-1898	R11	470M Ohm Insulated ..... 1/2 W	
63-1912	R7	1 Megohm Insulated ..... 1/2 W	
63-1926	R6	2.2 Megohm Insulated ..... 1/2 W	
63-1940	R10	6.7 Megohm Insulated ..... 1/2 W	
63-1900	R15	2200 Ohm Insulated ..... 1/2 W	
		MISCELLANEOUS	
11-85		Line Cord and Plug	
14-1015		Model 815 Plastic Cabinet	
14-1015W		Model 815W Plastic Cabinet	
14-1015Y		Model 815Y Plastic Cabinet	
43-165		Handle Housing	
46-744		Tuning and Vol. Con. Knob (2 used)	
46-744Y		Tuning and Vol. Con. Knob (2 used) (815W & 815Y)	
49-643	SP1	5 1/4" P.M. Speaker	
		206-643 Output Trans.	
		208-643 Cone and Voice Coil	
54-30		8-32 x 5/16 Hex Nut (Spk. Mtg)	
54-129		Speed Nut (Used on 26-411 and 57-1409)	
57-1409		Cabinet Front Plate	
78-275		Socket Electrolytic	
78-611		Socket Octal Tube (6 Contact)	
78-806		Socket Miniature Tube	
78-807		Socket Miniature Tube (4 used)	
83-1057		Line Cord Insulating Strip	
83-1165		Handle Strap	
83-1166		Handle Strap (Slotted)	
83-1393		Handle Strip (Rubber)	
93-766		Steel Washer	
93-906		Black Felt Washer	
93-941		Bakelite Washer	
94-295		Gang Cond. Mtg. Bushing	
112-407		#6 x 3/8 R.H.S.T. Screw (2 Used on 43-165)	
112-497		#6 x 7/16 Straight Side B.H.S.T. Screw	
114-217		#8 x 1/4 Hex Hd. Slotted S.T. Screw (Spk. Mtg.)	
114-291		#8-32 x 7/16 Hex Hd. Slotted M.S. (Spk. Mtg.)	
125-17		Rubber Grommet	
139-71		Speaker Baffle	
139-75		Baffle Board	
159-69		Trimmont Stud (Cab Back Mtg.) (4 used)	
166-40		Rubber Bumper (or 166-41)	
171-10		Pilot Light Lens	
199-103		Flexible Handle Sleeve	
199-103Y		Flexible Handle Sleeve (6D815W & 815Y)	
152-xxx		Instruction Book	
S-14888	L1	Wavemagnet Assembly	
S-14978		Wavemagnet Assembly (6D815W only)	

Prices subject to change without notice.

ZENITH RADIO CORPORATION



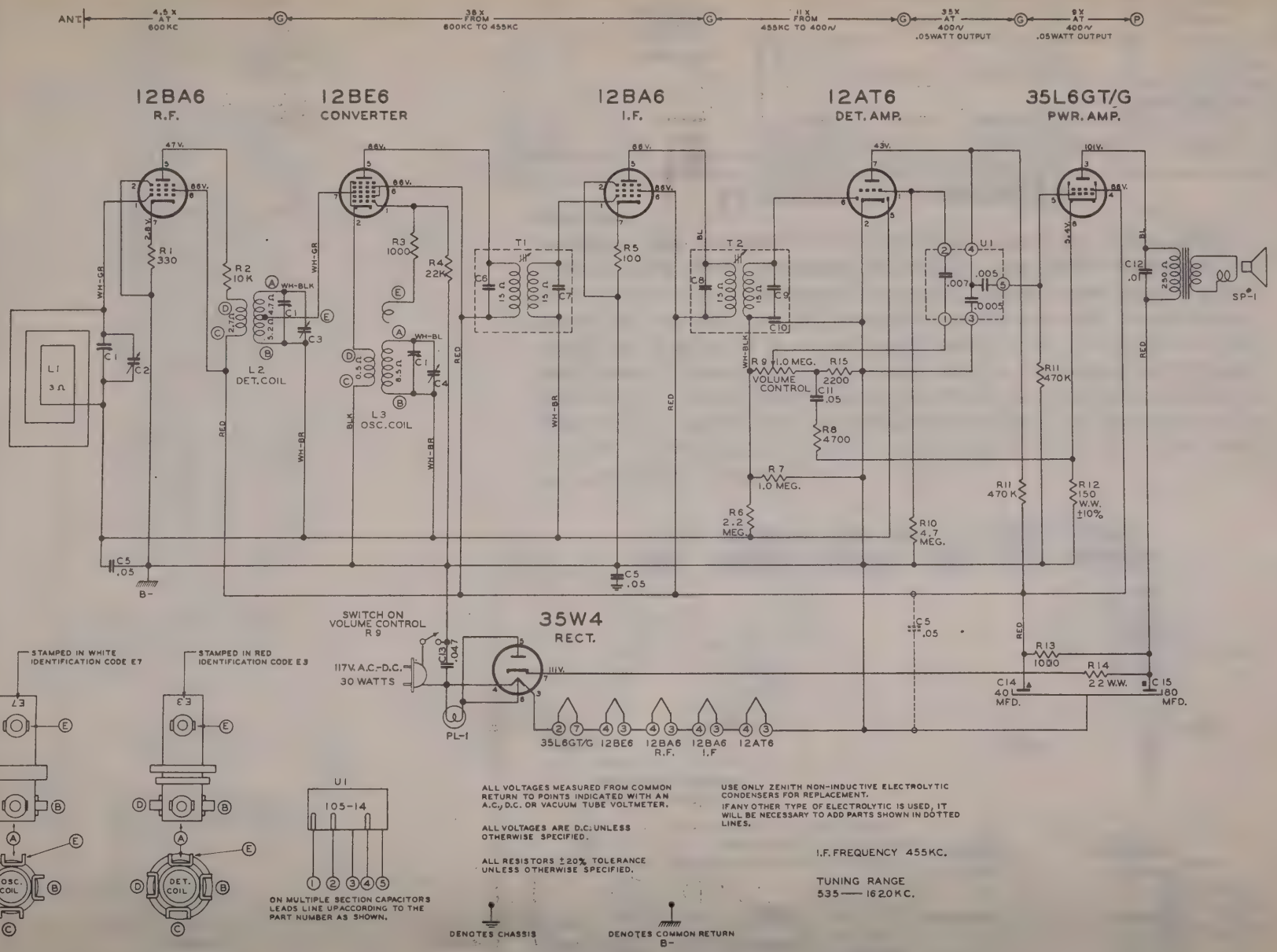
TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

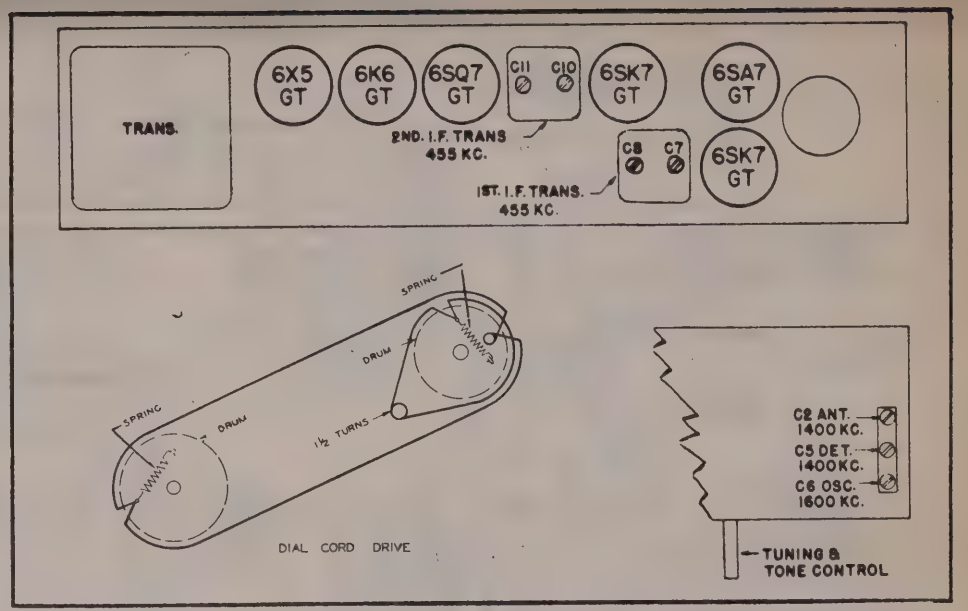
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I.F. Alignment
2	Single Turn Loosely Coupled to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-3	Detector Alignment
4		--	1400 Kc.	1400 Kc.	C-2	Antenna Alignment


ANT
4.5 X AT 600KC
38 X FROM 600KC TO 455KC
11 X FROM 455KC TO 400~
35 X AT 400~ .05WATT OUTPUT
8 X AT 400~ .05WATT OUTPUT
12BA6 R.F.
12BE6 CONVERTER
12BA6 I.F.
12AT6 DET. AMP.
35L6GT/G PWR. AMP.
R1 330
R2 10K
R3 1000
R4 22K
R5 100
R6 2.2 MEG.
R7 1.0 MEG.
R8 4700
R9 1.0 MEG. VOLUME CONTROL
R10 4.7 MEG.
R11 470K
R12 150 W.W. ±10%
R13 1000
R14 22 W.W.
R15 2200
C1
C2
C3
C4
C5 .05
C6 15
C7 15
C8 15
C9 15
C10
C11 .05
C12 .01
C13 .047
C14 40 MFD.
C15 180 MFD.
T1
T2
U1
.007
.005
.0005
L1 3Ω
L2 DET. COIL
L3 OSC. COIL
SP-1
B-
SWITCH ON VOLUME CONTROL R9
117V. A.C.-D.C. 30 WATTS
35W4 RECT.
PL-1
111V.
35L6GT/G 12BE6 12BA6 R.F. 12BA6 I.F 12AT6
STAMPED IN WHITE IDENTIFICATION CODE E7
STAMPED IN RED IDENTIFICATION CODE E3
OSC. COIL
DET. COIL
105-14
ON MULTIPLE SECTION CAPACITORS LEADS LINE UPACCORDING TO THE PART NUMBER AS SHOWN.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT.
IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.
I.F. FREQUENCY 455KC.
TUNING RANGE 535 — 1620 KC.
DENOTES CHASSIS
DENOTES COMMON RETURN B-

46-522		Dummy Knob	.10
46-538		Tuning Control Knob	.10
46-548		Radio-Phono Reject Switch Knob (2 used)	.07
76-413		Tuning Control Shaft	.29
78-570		Dial Light Socket & Wire Assembly	.40
80-402		Dial Cord Tension Spring (2 used)	.03
80-558		Tuning Shaft Tension Spring	.03
100-36		Dial Light Bulb - 6.3V. .250 Ampere (2 used)	.10
159-50		Snap Button (Dial Scale Mtg.) (6 used)	.01
188-30		Tuning Shaft Retaining Ring	1.20C
188-34		Pointer Retaining Ring	1.20C
188-48		Volume Control Knob Ring (2 used)	.04
188-54		Tuning Knob Clamping Ring	.02
192-91		Dial Crystal	.64
S-10953		Pointer & Pulley Assembly (59-148)	.40
S-11161		Drive Pulley Cord & Eyelet Assembly	.06
S-11162		Pointer Pulley Cord & Eyelet Assembly	.06
S-11165		Dial Mounting Plate & Stud Assembly	.60
S-11168		Drive Pulley & Bushing Assembly (Gang Condenser)	.41
S-11558		Decorative Ring & Control Knob Assembly	.28
S-13089		Tuning Control Knob Assembly	.45
		COILS & CHOKES	
95-909	(T1)	1st I.F. Transformer	1.85
95-910	(T2)	2nd I.F. Transformer	2.15
S-11163	(L2)	Detector Coil Assembly	.71
S-11164	(L3)	Oscillator Coil Assembly	.58
		CONDENSERS	
22-138	(C16)	.2 Mfd. 200 V.	.33
22-171	(C3)	.05 Mfd. 600 V.	.26
22-288	(C20)	.003 Mfd. 600 V.	.20
22-327	(C9)	.02 Mfd. 200 V.	.20
22-448	(C14)	.004 Mfd. 600 V.	.20
22-829	(C4)	.05 Mfd. 200 V.	.20
22-830	(C15)	.02 Mfd. 600 V.	.20
22-854	(C13)	.0005 Mfd. 600 V.	.20
22-1041	(C19)	.005 Mfd. 400 V.	.20
22-1362	(C12)	.004 Mfd. 600 V.	.20
22-1369	(C1)	Three Gang Variable Capacitor	5.40
22-1372	(C17, C18)	Electrolytic Capacitor - 15 Mfd. - 350 V. 15 Mfd. - 450 V.	2.00
22-1386	(C21)	.02 Mfd. 200 V.	.20
		RESISTORS	
63-156	(R1)	10,000 Ohm 1 Watt	.12
63-296	(R2)	220,000 Ohm 1/4 Watt	.09
63-579	(R3)	220 Ohm 1/4 Watt	.09
63-589	(R5)	10,000 Ohm 1/4 Watt	.09
63-597	(R13)	470,000 Ohm 1/4 Watt	.09
63-600	(R7)	2.2 Megohm 1/4 Watt	.09
63-605	(R6)	1000 Ohm 1/2 Watt	.10
63-641	(R10)	10,000 Ohm 1/4 Watt	.09
63-655	(R14)	220,000 Ohm 1/4 Watt	.09
63-656	(R15)	270,000 Ohm 1/4 Watt	.09
63-673	(R4)	8.2 Megohm 1/4 Watt	.09
63-976	(R11)	15 Megohm 1/4 Watt	.09
63-1058	(R8)	22,000 Ohm (Insl.) 2 Watt	.36
63-1223	(R16)	1.0 Ohm W.W. (Insl.) 1/2 Watt	.24
63-1340	(R9)	Volume Control & Switch	1.81
63-1341	(R12)	Tone Control	1.20
		MISCELLANEOUS	
2-120		Cabinet Bottom	.35
11-87		Line Cord & Plug (8 ft.)	.65
15-65		Phono Socket Cap & Insulator (Used on S-11167)	.27
19-123		Record Changer Mtg. Clip (3 used)	.10
40-31		Cover Lift Hinge	1.30
49-515		5" Dynamic Speaker	8.00
		206-515 Output Transformer	1.97
		207-515 Field Coil (Not Replaceable)	----
		208-515 Cone & Voice Coil	1.73
57-1063		Escutcheon	5.70
57-1101		Chassis Cover Plate (Perforated)	.90
70-112		#2 x 5/16" R.H.W.S. (Escutcheon Mtg.)	.50C
70-117		#6 x 5/16 Phillips R.H.W.S. (Cover Plate Mtg.)	.01
78-555		Phono Plug Socket (6 contact)	.11
78-611		Octal Base Tube Socket (8 contact) (6 used)	.12
80-407		Record Changer Mounting Spring (4 used)	.02
83-1218		Insulating Strip (Gang Condenser)	.01
85-337	(S1)	Phono-Radio Switch	.72
85-349	(S2)	Record Reject Switch	.60
94-295		Bushing (Switch Mtg.)	.04
94-334		Capacitor & Switch Mounting Bushing	.67C
95-911		Power Transformer (117 V. 50-60 cycle)	6.20
110-108		Grille Cloth (See S-12687)	----
110-117		Grille Cloth (6R084E only)	1.20
112-544		Record Changer Mounting Screw (3 used)	.11
114-128		#10 x 1-1/16" Hex Washer Hd. Self Tapping Screw (Chassis Mtg.) (or 114-264)	1.81C
125-16		Rubber Grommet (Phono Socket & Cable)	.03
125-17		Rubber Grommet (2 used)	.03
125-45		Rubber Grommet (3 used)	.03
126-468		Capacitor Shield (22-1369)	.01
139-58		Baffle Board	.40
196-82		Dial Crystal Gasket	.10
202-380		Instruction Book	.05
202-381		Phono Instruction Sheet	.10
S-11167		Phono Socket & Cable Assembly	1.25
S-11382	(L1)	Wavemagnet Assembly (26B)	.80
S-11468		Record Changer Assembly (Non-Intermixer)	----
S-12687		Gasket & Grille Cloth Assembly (6R084 only)	1.20

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

A feature of chassis 6C21 is a high gain tuned R.F. stage ahead of the conventional superheterodyne circuit.

When making repairs or adjustments on the chassis be sure to have the Phono-Radio switch in Radio position (button out).

The Tone Control circuit used in chassis 6C21 is unusual. Attenuation or control occurs in both the grid and plate circuit of the triode section of the 6SQ7 tube. To increase the bass response Resistor R10 and Capacitor C9 boost the bass in the grid circuit.

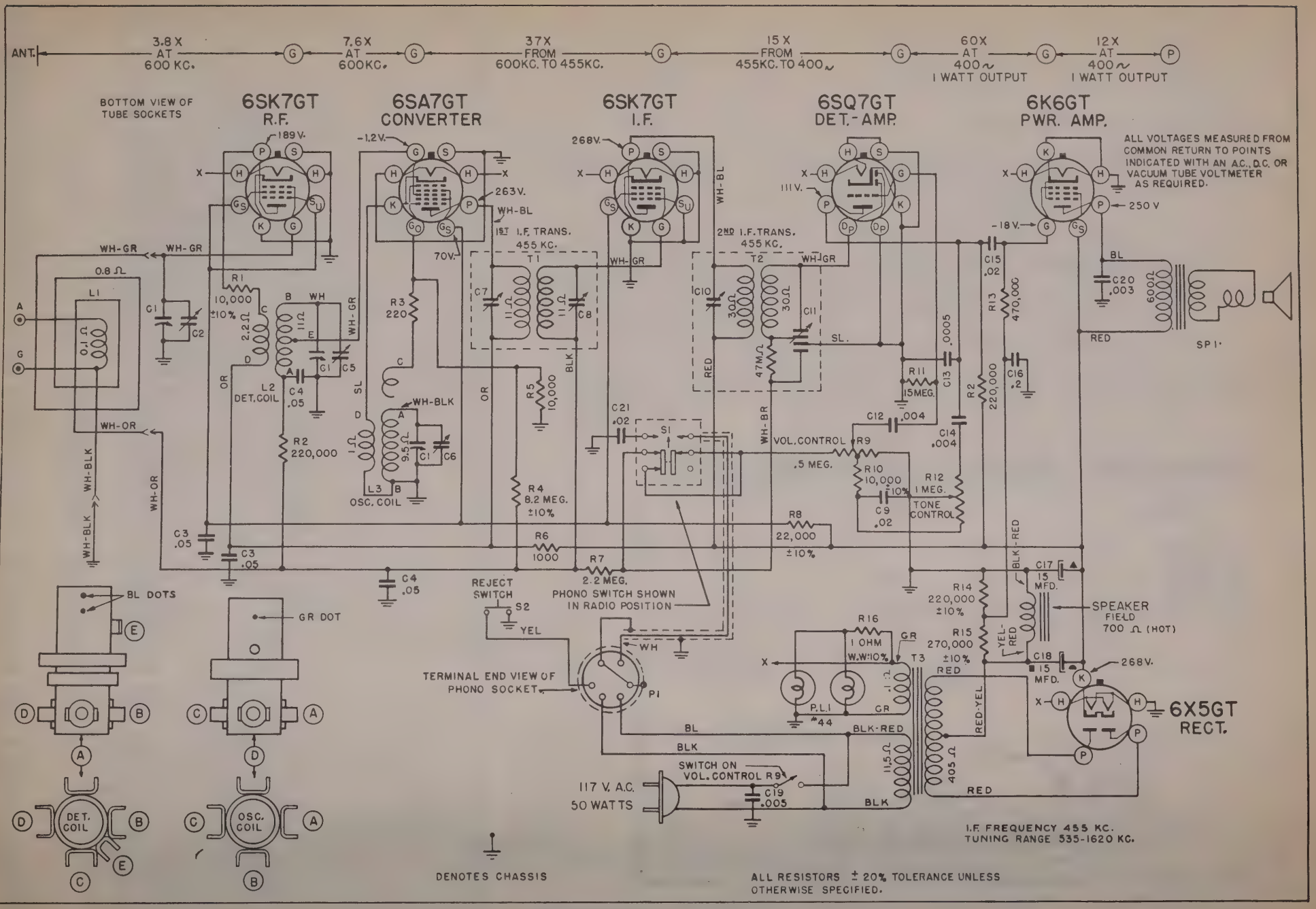
Capacitor C14 and the Variable Tone Control R12 attenuate the highs in the plate circuit.

When the tone control R12 is in the treble position attenuation to highs are greatly reduced in the plate circuit and minimum bass boost takes place in the grid circuit.

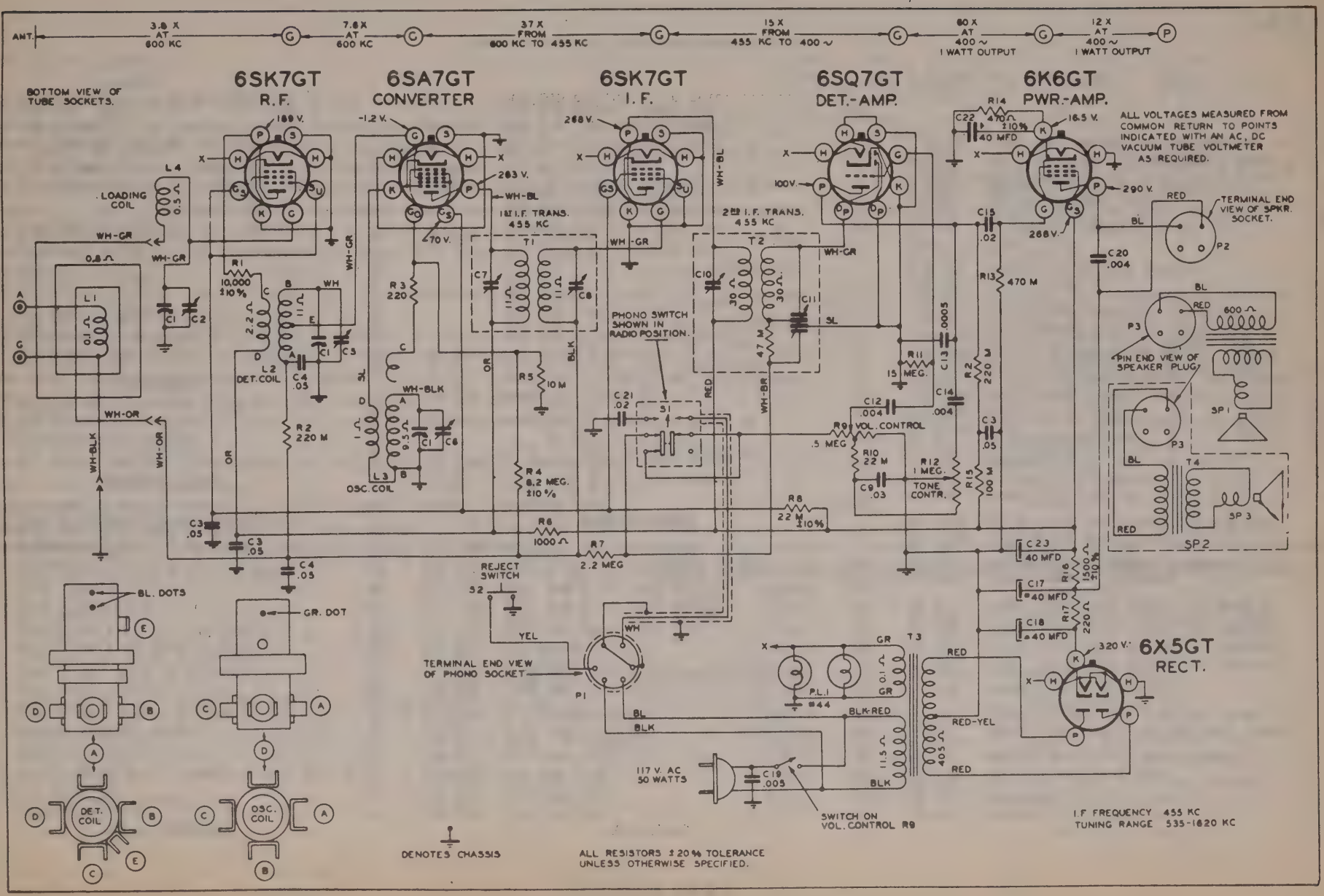
When the tone control is in bass position, attenuation to the highs takes place in the plate circuit with maximum bass boost in the grid circuit.

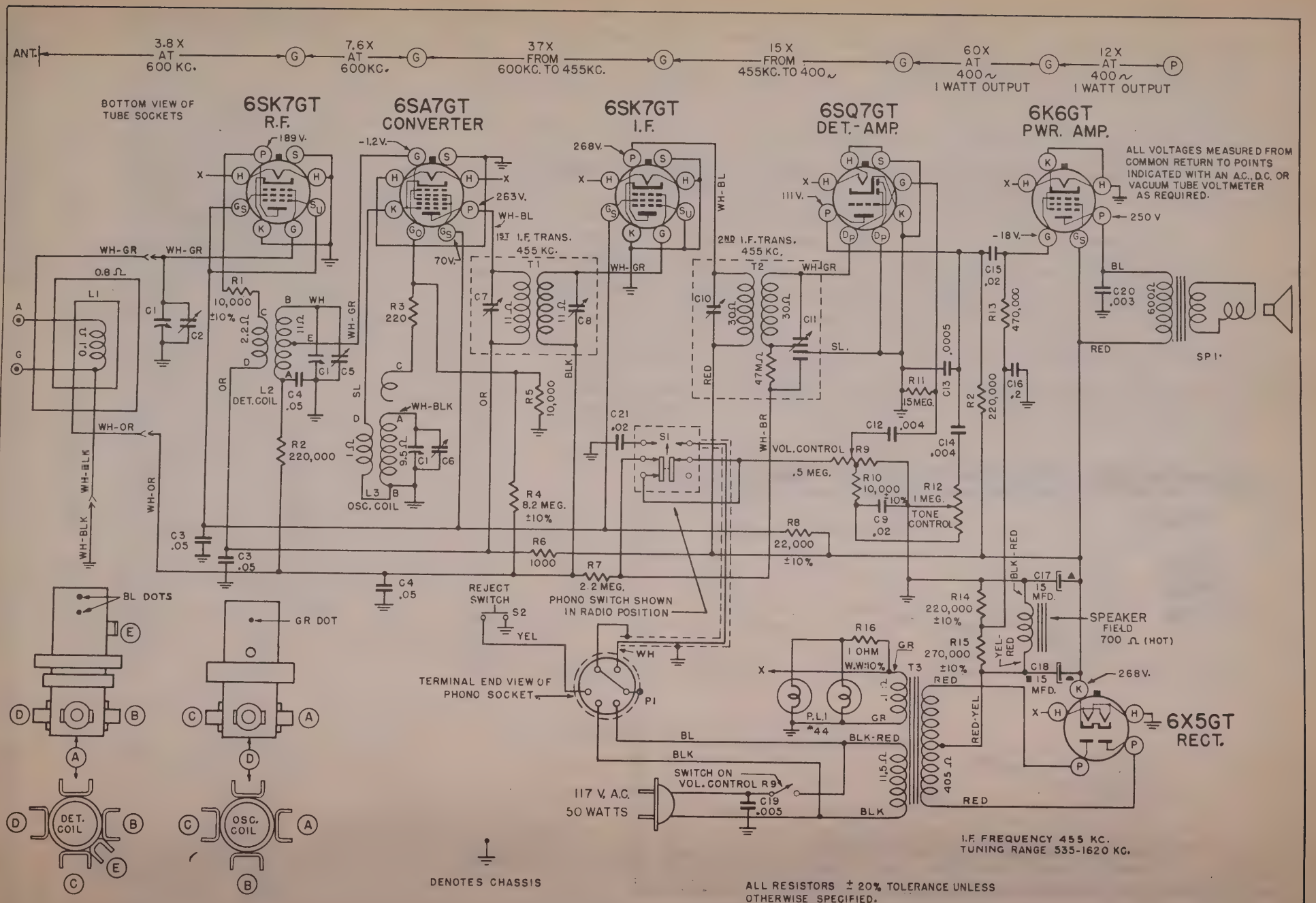
The result of this arrangement allows a smooth tone control over the audio frequency range.

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-7-, C-8, C-10, C-11	Align I F
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-6	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc.	C-5	Align det.
4		--	1400 Kc.	1400 Kc.	C-2	Align Ant.



MODELS 6R084


ANT.
3.8 X AT 600 KC
7.8 X AT 600 KC
37 X FROM 600 KC TO 455 KC
15 X FROM 455 KC TO 400 ~
60 X AT 400 ~ 1 WATT OUTPUT
12 X AT 400 ~ 1 WATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS.
6SK7GT R.F.
6SA7GT CONVERTER
6SK7GT I.F.
6SQ7GT DET.-AMP.
6K6GT PWR.-AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN AC, DC VACUUM TUBE VOLTMETER AS REQUIRED.
LOADING COIL
L4
L1
L2 DET. COIL
L3 OSC. COIL
1ST I.F. TRANS. 455 KC
2ND I.F. TRANS. 455 KC
PHONO SWITCH SHOWN IN RADIO POSITION.
VOL. CONTROL
TONE CONTR.
REJECT SWITCH
TERMINAL END VIEW OF PHONO SOCKET
TERMINAL END VIEW OF SPKR. SOCKET
PIN END VIEW OF SPEAKER PLUG
SP1
SP2
SP3
6X5GT RECT.
117 V. AC 50 WATTS
SWITCH ON VOL. CONTROL R9
BL. DOTS
GR. DOT
DET. COIL
OSC. COIL
DENOTES CHASSIS
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
I.F FREQUENCY 455 KC
TUNING RANGE 535-1620 KC


ANT.
3.8 X AT 600 KC.
7.6X AT 600KC.
37X FROM 600KC. TO 455KC.
15 X FROM 455KC. TO 400~
60X AT 400~ 1 WATT OUTPUT
12X AT 400~ 1 WATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS
6SK7GT R.F.
6SA7GT CONVERTER
6SK7GT I.F.
6SQ7GT DET.-AMP.
6K6GT PWR. AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
189 V.
-1.2V.
263V.
268V.
111 V.
-18 V.
250 V
70V.
1ST I.F. TRANS. 455 KC.
2ND I.F. TRANS. 455 KC.
WH-GR
WH-BL
WH-BR
WH-OR
WH-BLK
BL
RED
BLK
BLK-RED
RED-YEL
YEL-RED
GR
YEL
OR
SL
L1
L2 DET. COIL
L3 OSC. COIL
T1
T2
T3
R1 10,000 ±10%
R2 220,000
R3 220
R4 8.2 MEG. ±10%
R5 10,000
R6 1000
R7 2.2 MEG.
R8 22,000 ±10%
R9 .5 MEG.
R10 10,000 ±10%
R11 1.5MEG.
R12 1 MEG. TONE CONTROL
R13 470,000
R14 220,000 ±10%
R15 270,000 ±10%
R16 1 OHM W.W. ±10%
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21
.05 .02 .004 .005 .2 15 MFD. .003
S1 VOL. CONTROL R9
S2 REJECT SWITCH
PHONO SWITCH SHOWN IN RADIO POSITION
P1
TERMINAL END VIEW OF PHONO SOCKET
BL DOTS
GR DOT
DET. COIL
OSC. COIL
SPEAKER FIELD 700 Ω (HOT)
SP1
6X5GT RECT.
117 V. A.C. 50 WATTS
SWITCH ON VOL. CONTROL R9
DENOTES CHASSIS
ALL RESISTORS ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY 455 KC.
TUNING RANGE 535-1620 KC.

MODELS 6R087-6R087Z
CHASSIS No. 6C22-6C22Z

TO THE SERVICE MAN:

A feature of chassis 6C22 and 6C22Z is a high gain tuned R.F. stage ahead of the conventional superheterodyne circuit.

When making repairs or adjustments on the chassis be sure to have the Phono-Radio switch in Radio position (button out).

The Tone Control circuit used in chassis 6C22 is unusual. Attenuation or control occurs in both the grid and plate circuit of the triode section of the 6SQ7 tube. To increase the bass response Resistor R10 and Capacitor C9 boost the bass in the grid circuit.

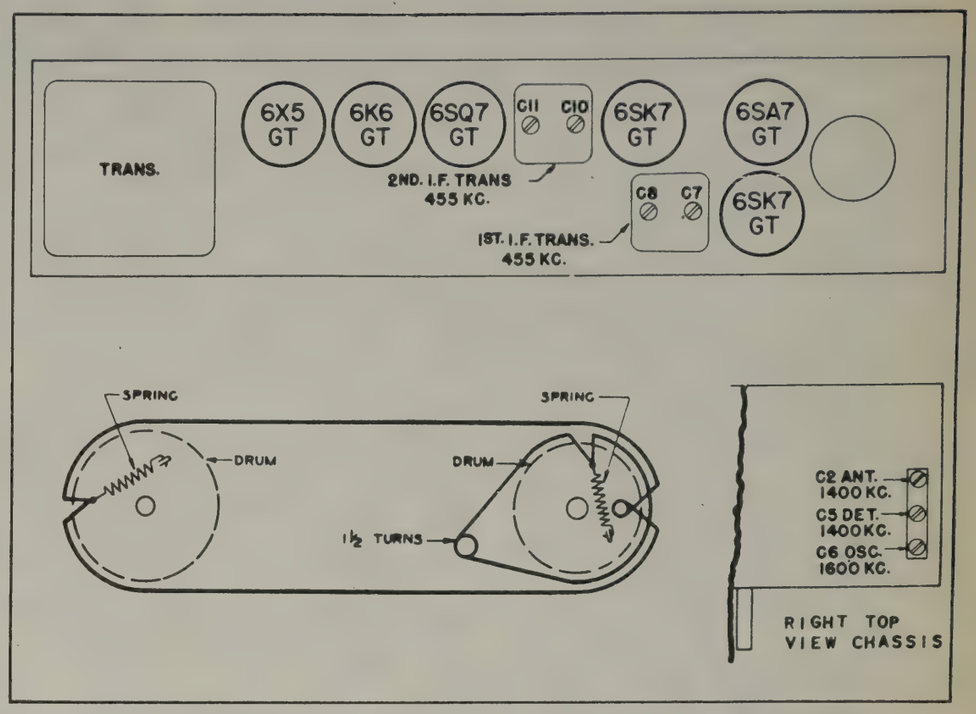
Capacitor C14 and the Variable Tone Control R12 attenuate the highs in the plate circuit.

When the tone control R12 is in the treble position attenuation to highs are greatly reduced in the plate circuit and minimum bass boost takes place in the grid circuit.

When the tone control is in bass position, attenuation to the highs takes place in the plate circuit with maximum bass boost in the grid circuit.

The result of this arrangement allows a smooth tone control over the audio frequency range.

Chassis 6C22 Model 6R087 uses an electro dynamic speaker. Chassis 6C22Z model 6R087Z uses a pm type speaker. Differences in the power supply are apparent when examining the schematic.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-7, C-8, C-10, C-11	Align I. F.
2	One turn loop coupled loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-6	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc	C-5	Align Det.
4		--	1400 Kc.	1400 Kc.	C-2	Align Ant.

PARTS LIST

DIAL ASSEMBLY

26-334	DIAL SCALE	.35
46-522	CONTROL KNOB (DUMMY)	.11
46-538	TUNING KNOB	.10
46-548	RADIO-PHONO REJECT KNOB	.07
57-1071	ESCUTCHEON PLATE	7.20
59-161	DIAL POINTER	.57
76-413	TUNING CONTROL SHAFT	.29
78-504	DIAL LIGHT SOCKET & WIRE	.16
80-365	TUNING SHAFT TENSION SPRING	.03
80-402	DIAL CORD TENSION SPRING	.03
100-36	DIAL LIGHT BULB 6.3 VOLTS	.10
159-50	PLUG BUTTON (DIAL SCALE MTG.)	.01
188-30	RETAINING RING (TUNING SHAFT)	1.20C
188-32	RETAINING RING (DIAL PULLEY)	1.03C
188-34	RETAINER RING	1.20C
188-54	KNOB CLAMPING RING	.015
192-94	DIAL CRYSTAL	2.20
S11161	DIAL PULLEY CORD & EYELET ASSEM.	.06
S11162	POINTER PULLEY CORD & EYELET ASSEM.	.06
S11168	CONDENSER PULLEY & BUSHING ASSEM.	.41
S11292	DIAL PULLEY & BUSHING ASSEM.	.16
S11558	TONE & VOLUME CONTROL KNOB & RING ASSEM.	.28

CHOKES & COILS

95-909	1ST I.F. TRANSFORMER	1.85
95-910	2ND I.F. TRANSFORMER	2.15
S11163	DETECTOR COIL ASSEM.	.71
S11164	OSCILLATOR COIL ASSEM.	.58
S11896	ANTENNA LOADING COIL ASSEM.	.34

CONDENSERS

22-138	.2 MFD. (C16) 200 V.	.33
22-171	.05 MFD. (C3) 600 V.	.26
22-448	.004 MFD. (C14 & C20) 600 V.	.20
22-829	.05 MFD. (C4) 200 V.	.20
22-830	.02 MFD. (C15) 600 V.	.20
22-854	.0005 MFD. (C13) 600 V.	.20
22-1041	.005 MFD. (C19) 400 V.	.20
22-1157	.03 MFD. (C9) 200 V.	.20
22-1362	.004 MFD. (C12) 600 V.	.20
22-1369	3 SECTION GANG COND. (C1)	5.40
22-1372	DRY ELECTROLYTIC 15 MFD.-450V. X 15 MFD.-350V. X (C17 & C18)	---- 2.00
22-1382	DRY ELECTROLYTIC 40 X 40 MFD. 450V. X 40 MFD.-25 V. (Z MODELS)	---- 3.25
	(C17, 18, 22)	.20
22-1611	DRY ELECTROLYTIC 40 MFD-450V (C23-6C22Z)	1.81
22-1386	.02 MFD. (C21) 600 V.	
22-1611	DRY ELECTROLYTIC 40 MFD. (C23) 450 V. (2 MODELS)	

RESISTORS

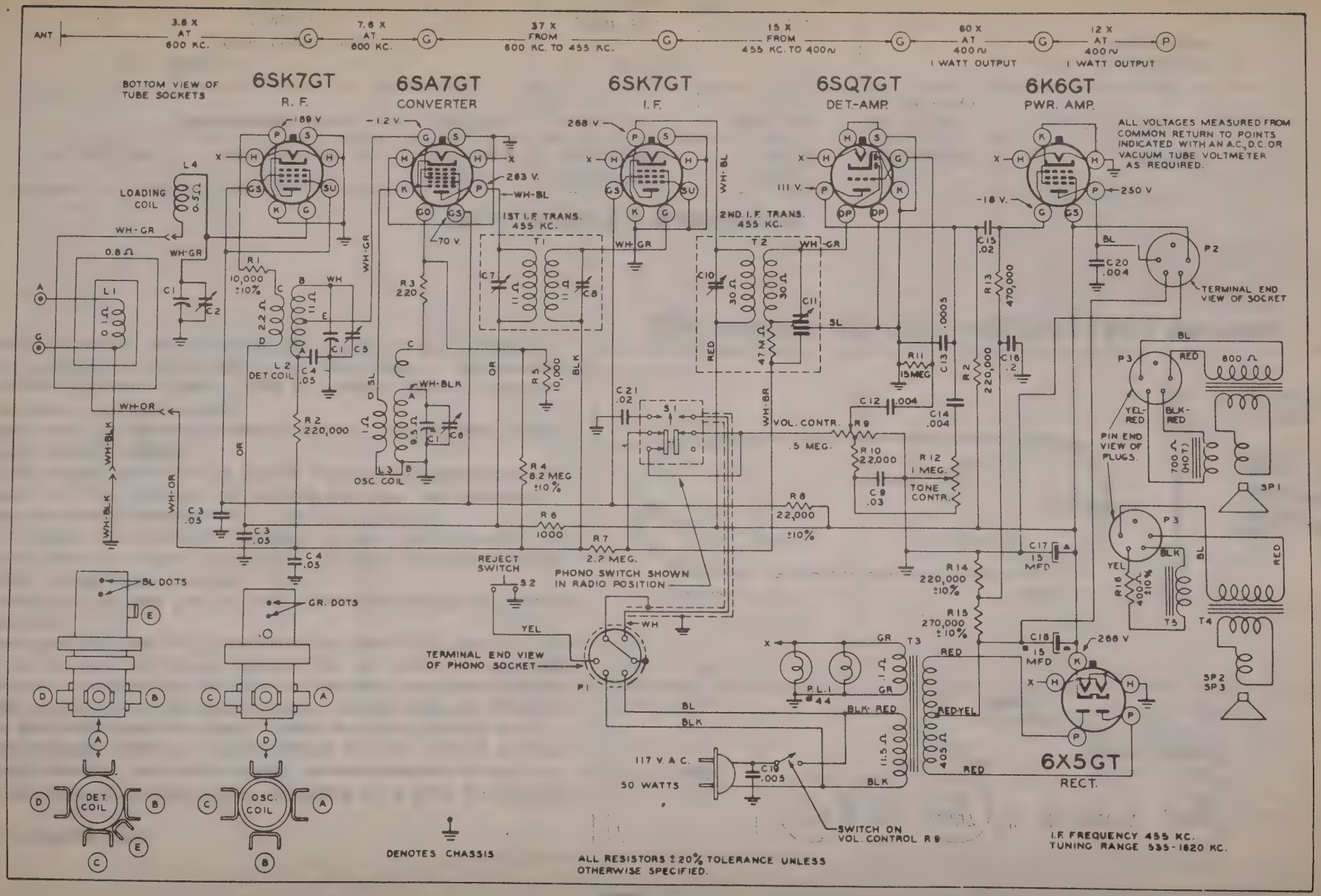
63-156	10M OHM (R1) 1 WATT	.12
63-296	220M OHM (R2) 1/4 WATT	.09
63-579	220 OHM (R3) 1/4 WATT	.09
63-589	10M OHM (R5) 1/4 WATT	.09
63-591	22M OHM (R10) 1/4 WATT	.09
63-595	100M OHM (R15-6C22Z) 1/4 WATT	.09
63-597	470M OHM (R13) 1/4 WATT	.09
63-600	2.2 MEGOHM (R7) 1/4 WATT	.09
63-605	1M OHM (R6) 1/2 WATT	.10
63-655	220M OHM (R14-6C22) 1/4 WATT	.09
63-656	270M OHM (R15-6C22) 1/4 WATT	.09
63-673	8.2 MEGOHM (R4) 1/4 WATT	.09
63-976	15 MEGOHM (R11) 1/4 WATT	.09
63-1058	22M OHM (R8) 2 WATT	.24
63-1170	1500 OHM W.W. (R16-6C22Z) 2 WATT	.36
63-1222	470 OHM W.W. (R14-6C22Z) 1 WATT	.24
63-1227	220 OHM W.W. (R17-6C22Z) 1 WATT	.24
63-1340	VOLUME CONTROL & SWITCH (R9)	1.81
63-1341	TONE CONTROL (1 MEGOHM) (R12)	1.20
63-1545	400 OHM 10W (R16-6C22)	

MISCELLANEOUS

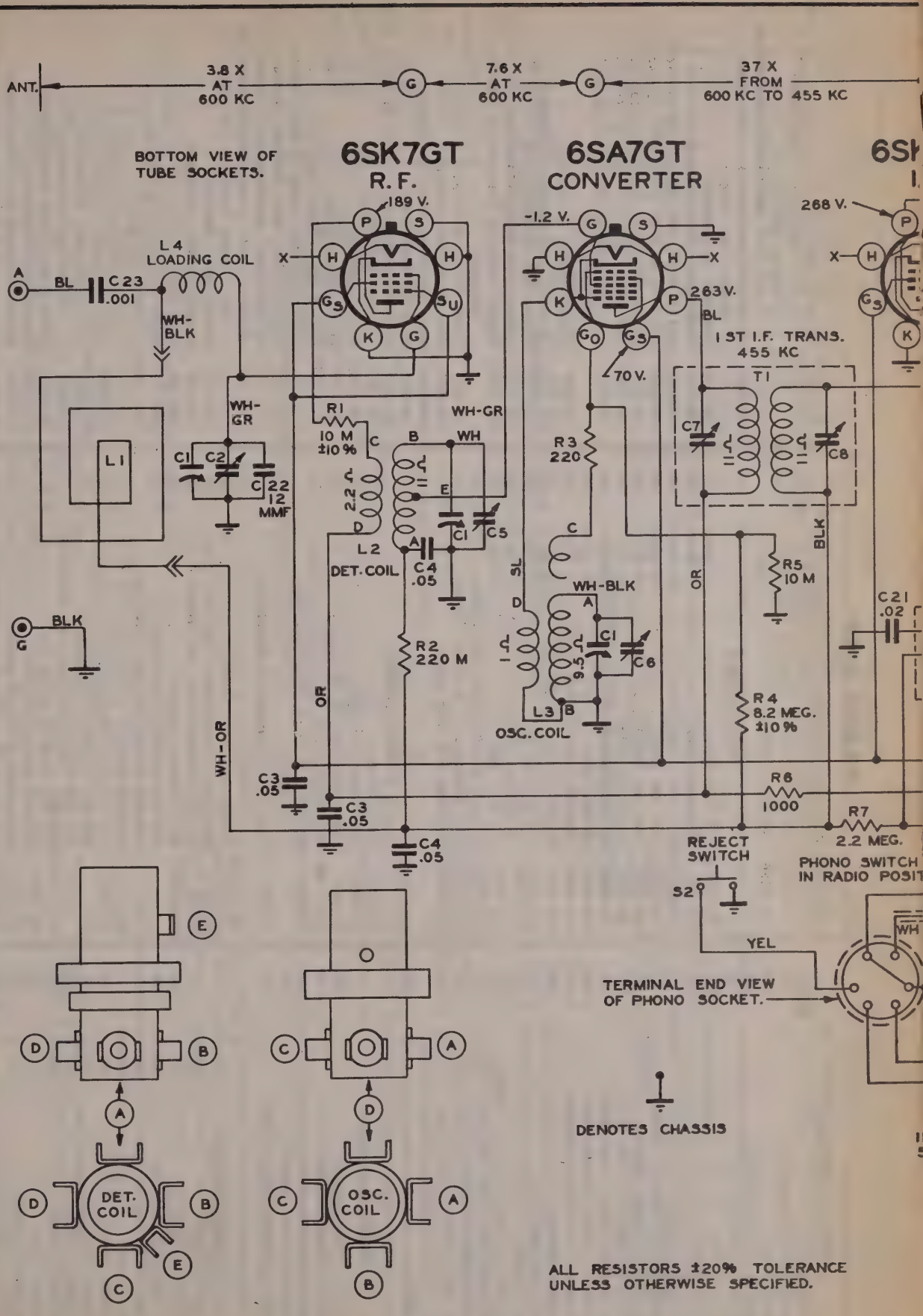
2-121	CABINET BACK	2.00
11-85	LINE CORD & PLUG	.65
11-87	LINE CORD & PLUG (Z MODELS)	.65
12-1138	WAVEMAGNET MTG. BRKT.	.14
15-23	PLUG CAP & INSULATOR (USED ON S11456)	.054
15-62	PLUG CAP & INSULATOR (USED ON S11456)	.22
19-123	PHONO UNIT MTG. CLIP	.10
27-81	MOUNTING FLANGE (SHAFT BEARING DISC)	.05
36-31	RECORD CHANGER PULL-OUT HANDLE	.57
49-526	10" DYNAMIC SPEAKER	11.00
	206-526 OUTPUT TRANSFORMER	2.57
	207-526 FIELD COIL (NOT REPLACEABLE)	----
	208-526 CONE & VOICE COIL	3.41
49-542	10" DYNAMIC SPEAKER (ALT. FOR 49-526)	11.00
	206-542 OUTPUT TRANSFORMER	2.57
	207-542 FIELD COIL (NOT REPLACEABLE)	----
	208-542 CONE & VOICE COIL	3.41
49-563	10" DYNAMIC SPEAKER (ALT. FOR 49-526)	11.00
	206-563 OUTPUT TRANSFORMER	2.57
	207-563 FIELD COIL (NOT REPLACEABLE)	----
	208-563 CONE & VOICE COIL	3.41
49-581	10" P.M. SPEAKER (Z MODEL (ALSO SEE S-132571)	
	OUTPUT TRANSFORMER (SEE 95-1011)	----
	208-581 CONE & VOICE COIL	3.41
49-585	10" P.M. SPEAKER (Z MODEL)	----
	296-585 OUTPUT TRANSFORMER	2.57
	208-585 CONE & VOICE COIL	3.41

52-377	SPEAKER CABLE (49-563)	.60
58-88	WAVEMAGNET PLUG (3 PRONG)	.07
58-132	SIX PRONG PLUG (USED ON S11456)	.12
58-156	SPEAKER PLUG (49-585)	.12
70-83	#6X1/2 WASHER HD. WOOD SCREW (CABINET BACK)	.65C
72-55	#6X3/8 FLAT PHILLIPS HD. WOOD SCREW.	.013
72-59	#2X2 1/2 PHILLIPS FLAT HD. WOOD SCREW (ESC. MTG.)	.015
78-128	SPEAKER PLUG SOCKET	.12
78-349	WAVEMAGNET PLUG SOCKET	.07
78-373	OCTAL BASE TUBE SOCKET (5 CONTACT)	.12
78-374	OCTAL BASE TUBE SOCKET (6 CONTACT)	.12
78-376	OCTAL BASE TUBE SOCKET (8 CONTACT)	.12
78-555	SIX PRONG SOCKET (USED ON S11456)	.11
78-611	OCTAL BASE TUBE SOCKET (Z MODEL) (8 CONTACT)	.12
78-623	PHONO SOCKET (6 PRONG)	.12
78-732	SPEAKER PLUG SOCKET (Z MODEL)	.15
80-463	PHONO MTG. SPRING	.03
83-1218	INSULATING STRIP (GANG COND.)	.01
83-1240	BLACK VINYLITE TRIM STRIP (RECORD CHANGER)	.75
85-337	PHONO-RADIO SWITCH	.72
85-349	RECORD REJECT SWITCH	.60
94-295	BUSHING-SWITCH MTG. (Z MODEL)	.036
94-334	BUSHING-SWITCH MTG.	.67C
95-911	POWER TRANSFORMER	6.20
95-1011	SPKR. OUTPUT TRANSFORMER (49-581)	
112-420	PHONO MTG. SCREW	.33
112-489	HANDLE MTG. SCREW (36-31)	.028
114-58	6-32 X 3/8 HEX ACCRN HD. M.S. SCREW	.43C
114-128	CHASSIS MTG. SELF TAPPING SCREW	1.81C
114-193	#8 X 3/16 HEX ACCRN NO.S.T. SCREW	.90C
114-202	#8-32X1-1/8 SLOTTED HEX. WASHER HD. S.T. SCREW (USED ON 12-1138)	.027
125-17	SWITCH MTG. GROMMETS	.02
125-45	CONDENSER MTG. GROMMETS	.026
196-80	DUST GASKET	.45
202-381	PHONO INSTRUCTION SHEET	.10
202-388	INSTRUCTION BOOK	.07
237/1	CABLE CLAMP	.02
S11450	WAVEMAGNET ASSEM. (30A)	3.31
S11456	INTER CONNECTING CABLE ASSEM.	2.20
S11468	RECORD CHANGER ASSEM.	----
S11920	RECORD CHANGER MTG. FRAME ASSEM.	5.07
S12864	DRIVE WHEEL & PIN ASSEM. (REC. CHANG.)	.24
S13257	10" P.M. SPKR. & TRANSFORMER ASSEM. (ALT. FOR 49-585) (Z MODEL)	

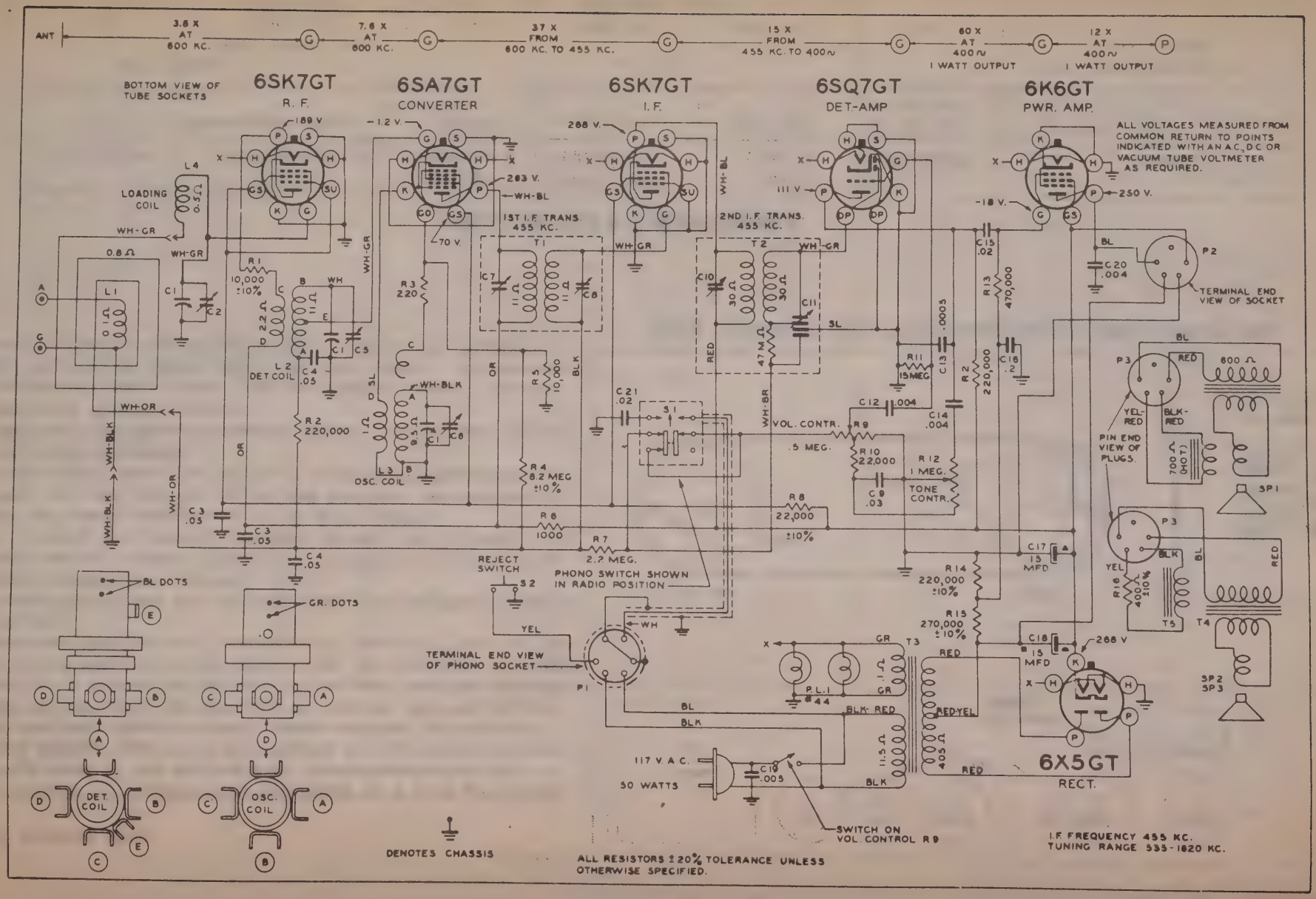
PRICES SUBJECT TO CHANGE WITHOUT NOTICE.


ANT
3.8 X AT 600 KC.
7.6 X AT 600 KC.
37 X FROM 600 KC. TO 455 KC.
15 X FROM 455 KC. TO 400~
60 X AT 400~ 1 WATT OUTPUT
12 X AT 400~ 1 WATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS
6SK7GT R. F.
6SA7GT CONVERTER
6SK7GT I. F.
6SQ7GT DET.-AMP.
6K6GT PWR. AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
LOADING COIL
1ST I.F. TRANS. 455 KC.
2ND. I.F. TRANS. 455 KC.
TERMINAL END VIEW OF SOCKET
PIN END VIEW OF PLUGS.
VOL. CONTR. R9 .5 MEG.
TONE CONTR.
PHONO SWITCH SHOWN IN RADIO POSITION
REJECT SWITCH S2
TERMINAL END VIEW OF PHONO SOCKET
BL DOTS
GR. DOTS
DET. COIL
OSC. COIL
117 V. A.C. 50 WATTS
SWITCH ON VOL. CONTROL R9
6X5GT RECT.
DENOTES CHASSIS
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY 455 KC.
TUNING RANGE 535-1820 KC.

MODEL 6R087 CHASSIS No. 6C22



MODEL 4D09777


ANT
3.8 X AT 600 KC.
7.6 X AT 600 KC.
37 X FROM 600 KC. TO 455 KC.
15 X FROM 455 KC. TO 400∿
60 X AT 400∿ 1 WATT OUTPUT
12 X AT 400∿ 1 WATT OUTPUT
BOTTOM VIEW OF TUBE SOCKETS
6SK7GT R. F.
6SA7GT CONVERTER
6SK7GT I. F.
6SQ7GT DET-AMP
6K6GT PWR. AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
LOADING COIL
1ST I.F. TRANS. 455 KC.
2ND I.F. TRANS. 455 KC.
TERMINAL END VIEW OF SOCKET
PIN END VIEW OF PLUGS.
VOL. CONTR. R9 .5 MEG.
TONE CONTR. R12 1 MEG.
REJECT SWITCH S2
PHONO SWITCH SHOWN IN RADIO POSITION
TERMINAL END VIEW OF PHONO SOCKET
BL DOTS
GR. DOTS
DET. COIL
OSC. COIL
117 V. A.C. 50 WATTS
SWITCH ON VOL. CONTROL R9
6X5GT RECT.
DENOTES CHASSIS
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY 455 KC.
TUNING RANGE 535-1820 KC.

MODEL 6R087 CHASSIS No. 6C22

MODEL 6R087ZZ
CHASSIS No. 6C22ZZ

TO THE SERVICE MAN:

A feature of chassis 6C22ZZ is a high gain tuned R.F. stage ahead of the conventional superheterodyne circuit.

When making repairs or adjustments on the chassis be sure to have the Phono-Radio switch in Radio position (button out).

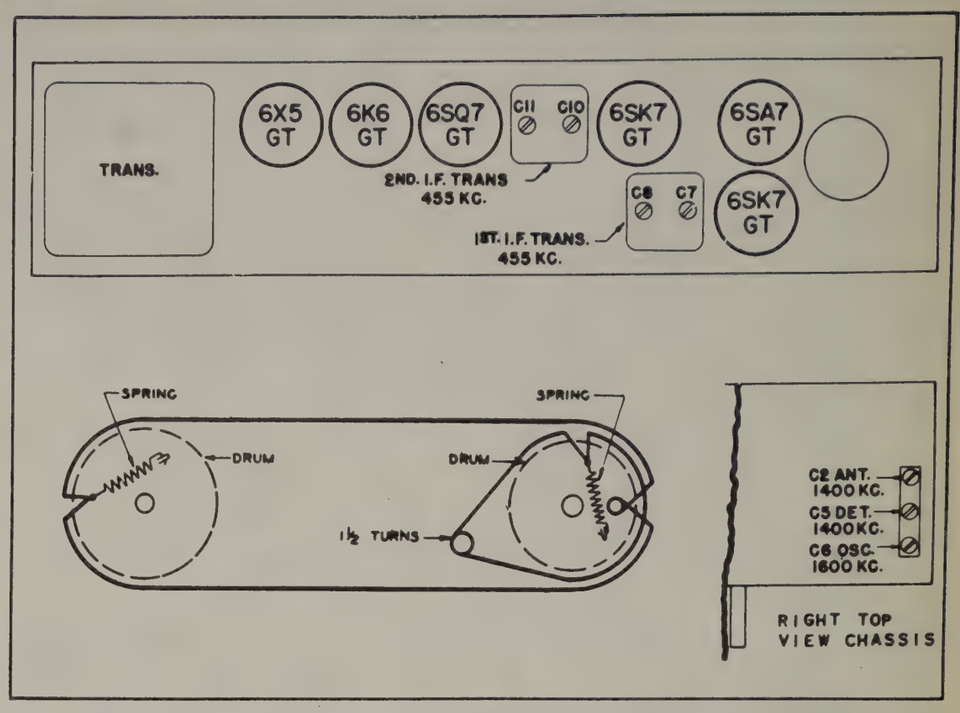
The Tone Control circuit used in chassis 6C22ZZ is unusual. Attenuation or control occurs in both the grid and plate circuit of the triode section of the 6SQ7 tube. To increase the bass response Resistor R10 and Capacitor C9 boost the bass in the grid circuit.

Capacitor C14 and the Variable Tone Control R12 attenuate the highs in the plate circuit.

When the tone control R12 is in the treble position attenuation to highs are greatly reduced in the plate circuit and minimum bass boost takes place in the grid circuit.

When the tone control is in bass position, attenuation to the highs takes place in the plate circuit with maximum bass boost in the grid circuit.

The result of this arrangement allows a smooth tone control over the audio frequency range.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-7,C-8 C-10,C11	Align I. F.
2	One turn loop coupled loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-6	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc.	C-5	Align Det.
4		--	1400 Kc.	1400 Kc.	C-2	Align Ant.

PARTS LIST

DIAL ASSEMBLY

26-334	Dial Scale	$0.35
46-522	Control Knob (Dummy)	.11
46-538	Tuning Knob	.10
46-548	Radio-Phono Reject Knob	.07
57-1071	Escutcheon Plate	7.20
59-161	Dial Pointer	.57
76-413	Tuning Control Shaft	.29
78-504	Dial Light Socket & Wire	.16
80-365	Tuning Shaft Tension Spring	.03
80-402	Dial Cord Tension Spring	.03
100-36	Dial Light Bulb 6.3 Volts	.10
159-50	Plug Button (Dial Scale Mtg.)	.01
188-30	Retaining Ring (Tuning Shaft)	1.20C
188-32	Retaining Ring (Dial Pulley)	1.03C
188-34	Retainer Ring	1.20C
188-54	Knob Clamping Ring	.015
192-94	Dial Crystal	2.20
S11161	Dial Pulley Cord & Eyelet Assem	.06
S11162	Pointer Pulley Cord & Eyelet Assem.	.06
S11168	Condenser Pulley & Bushing Assem.	.41
S11292	Dial Pulley & Bushing Assem	.16
S11558	Tone & Volume Control Knob & Ring Assem.	.28

CHOKES & COILS

95-909	1st I.F. Transformer	1.85
95-910	2nd I.F. Transformer	2.15
S1163	Detector Coil Assem	.71
S11164	Oscillator Coil Assem	.58
S13478	Antenna Loading Coil Assem.	.90

CONDENSERS

22-138	.2 Mfd. (C16)	.200 V.	.33
22-171	.05 Mfd. (C3)	.600 V.	.26
22-448	.004 Mfd. (C14 & C20)	.600 V.	.20
22-530	12 Mmfd	.600 V.	
22-1444	.001	.200 V.	
22-829	.05 Mfd. (C4)	.200 V.	.20
22-830	.02 Mfd. (C15)	.600 V.	.20
22-854	.0005 Mfd. (C13)	.600 V.	.20
22-1041	.005 Mfd. (C19)	.400 V.	.20
22-1157	.03 Mfd. (C9)	.200 V.	.20
22-1362	.004 Mfd. (C12)	.600 V.	.20
22-1369	3 Section Gang Cond. (C1)		5.40
22-1372	Dry Electrolytic 15 Mfd.-450V.X		....
	15 Mfd.-350V.X (C17 & C18)		$2.00
22-1386	.02 Mfd. (C21)	.600 V.	....

RESISTORS

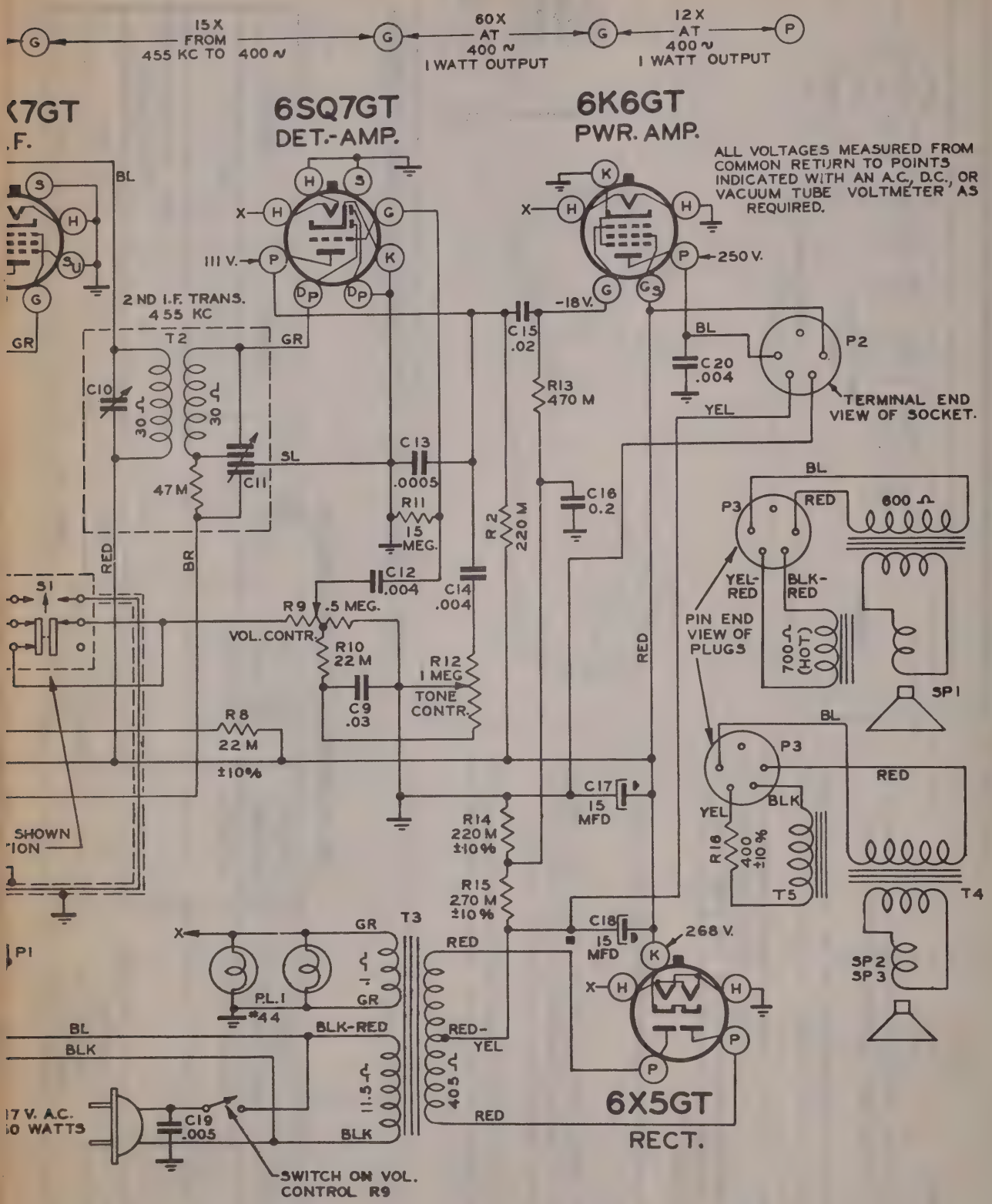
63-156	10M Phm (R1)	.1 Watt	.12
63-296	220M Ohm (R2)	.1/4 Watt	.09
63-579	220 Ohm (R3)	.1/4 Watt	.09
63-589	10M Ohm (R5)	.1/4 Watt	.09
63-591	22M Ohm (R10)	.1/4 Watt	.09
63-597	470M Ohm (R13)	.1/4 Watt	.09
63-600	2.2 Megohm (R7)	.1/4 Watt	.09
63-605	1M Ohm (R6)	.1/2 Watt	.10
63-655	220M Ohm (R14-6C22)	.1/4 Watt	.09
63-656	270M Ohm (R15-6C22)	.1/4 Watt	.09
63-673	8.2 Megohm (R4)	.1/4 Watt	.09
63-976	15 Megohm (R11)	.1/4 Watt	.09
63-1058	22M Ohm (R8)	.2 Watt	.24
63-1340	Volume Control & Switch (.5 Meg.) (R9)		1.81
63-1341	Tone Control (1 Megohm) (R12)		1.20
63-1545	400 Ohm 10W (R16-6C22)		....

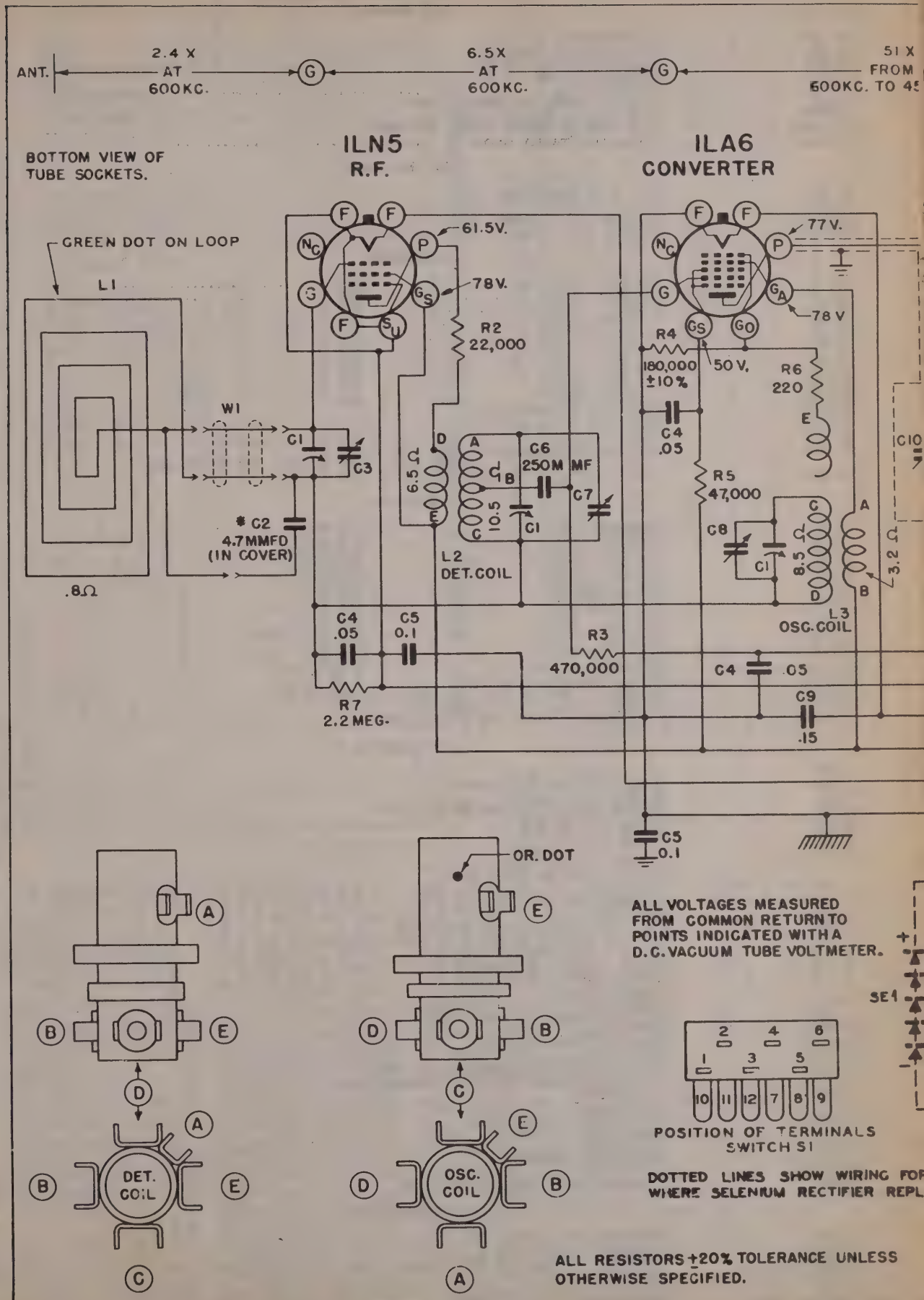
MISCELLANOUS

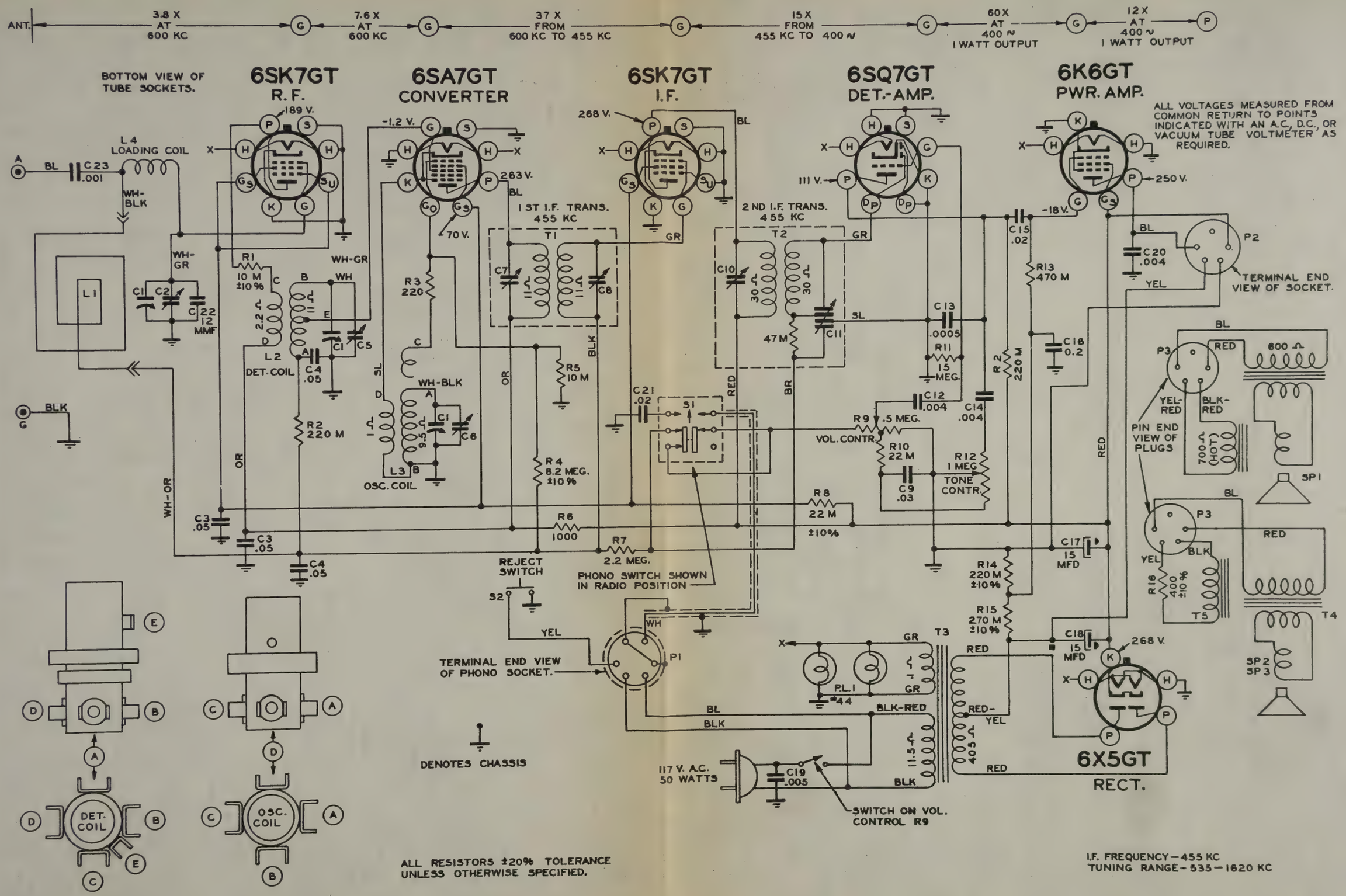
2-121	Cabinet Back	2.00
11-85	Line Cord & Plug	.65
11-87	Line Cord & Plug (Z Models)	.65
12-1138	Wavemagnet Mtg. Brkt.	.14
15-23	Plug Cap & Insulator (used on S11456)	.054
15-62	Plug Cap & Insulator (used on S11456)	.22
19-123	Phono Unit Mtg. Clip	.10
27-81	Mounting Flange (Shaft Bearing Disc)	.05
36-31	Record Changer Pull-out Handle	.57
45-526	10" Dynamic Speaker	11.00
	206-526 Output Transformer	2.57
	207-526 Field Coil (not replaceable)	....
	208-526 Cone & voice coil	3.41
49-563	10" Dynamic Speaker (alt. for 49-526)	11.00
	206-563 Output Transformer	2.57
	207-563 Field Coil (not replaceable)	....
	208-563 Cone & voice coil	3.41
52-377	Speaker cable (49-563)	.60
58-88	Wavemagnet Plug (3 prong)	.07
58-132	Six prong plug (used on S11456)	.12
58-152	Speaker plug	$0.15
70-83	#6 x 1/2 washer hd. wood screw (Cabinet Back)	.65C
72-55	#6 x 3/8 Flat Phillips Hd. Wood Screw	.013
72-59	#2 x 2-1/2 Phillips flat hd. wood. Screw (esc. mtg.)	.015
78-128	Speaker plug socket	.12
78-349	Wavemagnet plug socket	.07
78-373	Octal Base Tube sokcet (5 contact)	.12
78-374	Octal Base Tube socket (6 contact)	.12
78-376	Octal Base Tube socket (8 contact)	.12
78-555	Six Prong Socket (used on S11456)	.11
78-611	Octal Base Tube Socket (Z Model). (8 contact)	.12
78-623	Phono Socket (6 prong)	.12
78-732	Speaker Plug Socket (Z Model)	.15
89-463	Phono Mtg. Spring	.03
83-1218	Insulating Strip (gang cond.)	.01
83-1240	Black vinylite Trim Strip (record Changer)	.75
85-337	Phono-Radio Switch	.72
85-349	Record Reject switch	.60
94-295	Bushing-Switch Mtg. (Z Model)	.036
94-334	Bushing-Switch Mtg.	.67C
95-911	Power Transformer, 117V. 50-60	6.20
95-1007	Output Transformer	2.70
95-1019	Filter Choke	2.25
112-420	Phono Mtg. Screw	.33
112-489	Handle Mtg. Screw (36-31)	.028
114-58	6-32 x 3/8 Hex Accrn Hd. M.S. Screw	.43C
114-128	Chassis Mtg. Self Tapping Screw	1.81C
114-193	#8 x 3/16 Hex Accrn Hd. S.T. Screw	.90C
114-202	#8-32 x 1-1/8 slotted Hex. Washer Hd S.T. Screw (used on 12-1138)	.027
125-17	Switch Mtg. Grommets	.02
125-45	Condenser Mtg. Grommets	.026
196-80	Dust Gasket	.45
202-381	Phono Instruction Sheet	.10
202-388	Instruction Book	.07
237-1	Cable Clamp	.02
S13479	Loop Antenna	1.00
S13391	12" PM Speaker Assembly	18.50
S13406	10" PM Speaker Assembly	16.50
S11456	Inter Connecting Cable Assem.	2.20
S11468	Record Changer Assem.	....
S11920	Record Changer Mtg. Frame Assem	5.07
S12864	Drive Wheel & Pin Assem. (Rec. Chang).	.24

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

CPC--12M--11-1-47


15 X FROM 455 KC TO 400 ~
60 X AT 400 ~ 1 WATT OUTPUT
12 X AT 400 ~ 1 WATT OUTPUT
6SQ7GT DET.-AMP.
6K6GT PWR. AMP.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C., OR VACUUM TUBE VOLTMETER AS REQUIRED.
2 ND I.F. TRANS. 455 KC
T2
C10
C11
47 M
C13 .0005
R11 15 MEG.
C12 .004
C14 .004
R9 .5 MEG. VOL. CONTR.
R10 22 M
C9 .03
R12 1 MEG TONE CONTR.
R8 22 M ±10%
R2 220 M
C15 .02
R13 470 M
C16 0.2
C17 15 MFD
R14 220 M ±10%
R15 270 M ±10%
C18 15 MFD
C20 .004
P2
TERMINAL END VIEW OF SOCKET.
P3
PIN END VIEW OF PLUGS
600 Ω
700 Ω (HOT)
R16 400 Ω ±10%
T5
T4
SP1
SP2 SP3
T3
PL.1 #44
6X5GT RECT.
C19 .005
SWITCH ON VOL. CONTROL R9
111 V.
250 V.
268 V.
-18 V.
I.F. FREQUENCY—455 KC
TUNING RANGE—535—1620 KC


ANT.
2.4 X AT 600KC.
6.5X AT 600KC.
51 X FROM 600KC. TO 45
BOTTOM VIEW OF TUBE SOCKETS.
1LN5 R.F.
1LA6 CONVERTER
GREEN DOT ON LOOP
L1
.8Ω
W1
C1
C3
* C2 4.7MMFD (IN COVER)
61.5V.
78V.
R2 22,000
6.5Ω
L2 DET. COIL
C6 250M MF
C7
C4 .05
C5 0.1
R7 2.2 MEG.
R3 470,000
77V.
78 V
R4 180,000 ±10%
50 V.
R6 220
C4 .05
R5 47,000
C8
8.5Ω
3.2Ω
L3 OSC. COIL
C4 .05
C9 .15
C5 0.1
OR. DOT
DET. COIL
OSC. COIL
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.
SE1
POSITION OF TERMINALS SWITCH S1
DOTTED LINES SHOW WIRING FOR WHERE SELENIUM RECTIFIER REPL
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.



MODEL 6R087ZZ CHASSIS No. 6C22ZZ

MODEL 6G001
CHASSIS No. 6C40

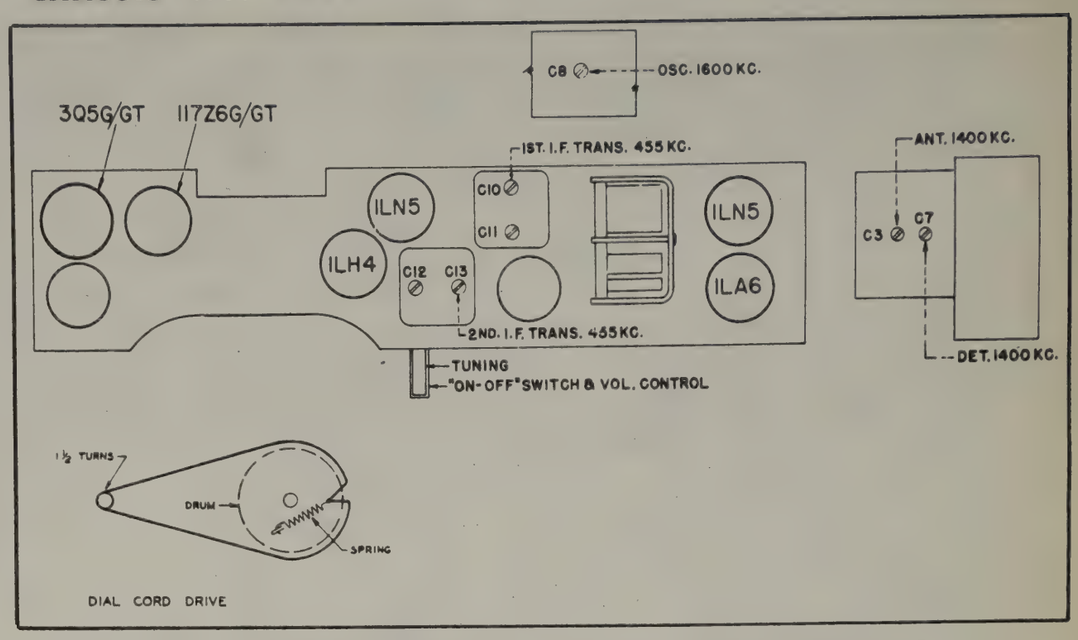
TO THE SERVICE MAN:

The 6C40 chassis is an AC, DC or battery operated superheterodyne circuit with a stage of RF amplification. The chassis is isolated from the DC circuit, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the terminal strip to which C5 is connected. The DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will appear. Microphonic tubes will cause audio howl. Check 1LA6.

The wavemagnet is connected to the chassis through the hinges in the cabinet, snaps and flexible leads. If the RF becomes weak or dead, check resistance of wavemagnet at condenser gang. The DC resistance across the two leads should be approximately 1 ohm. If the circuit is open, remove the two screws that hold the handle and top panel. When the top is removed, the wavemagnet connecting leads will be visible for inspection. Also loosen the snap-on socket and check for shorted or broken leads.

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the wavemagnet can be plugged in. All the connections and adjustments can be made from the top of the chassis. Connect a signal generator, through a .1 mfd. dummy antenna, to the lug on top of the center section of the gang condenser (converter grid) and condenser gang frame. Connect an output meter across the voice coil of the speaker (two lugs provided). Set the signal generator to 455 Kc. and adjust C10, C11, C12 and C13 for maximum indication on the output meter. Always keep the signal output from the generator just high enough to get an indication, otherwise excessive loading may result. Remove the signal generator leads from the gang.

RF Alignment: Connect a two turn loop across the leads of the signal generator, loosely couple this loop to the wavemagnet. Set the signal generator and the dial pointer of the receiver to 1600 Kc. and adjust C8 to resonance. Set the signal generator and dial pointer to 1400 and adjust C7 (detector) and C3 (RF) to resonance. These trimmers are on the side of gang condenser. Check operation and re-install set in cabinet. Tune in a weak station near 1400 Kc. or use background noise and readjust C3 through the hole in the side of the cabinet for maximum sensitivity.



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL TO	TRIMMERS	PURPOSE
1	Converter Grid	.1 Mfd	455 Kc.	BC	600 Kc.	C10-11-12-13	I.F. Alignment
2	Two turns loosely coupled to Wavemagnet		1600 Kc.	BC	1600 Kc.	C-8	Set Oscillator to scale
3	Two turns loosely coupled to Wavemagnet		1400 Kc.	BC	1400 Kc.	C-7	Align Det.
4	Two turns loosely coupled to Wavemagnet		1400 Kc.	BC	1400 Kc.	C-3	Align Wavemagnet

PART NO. — PARTS LIST — PRICE

DIAL ASSEMBLY

59-146 Dial Pointer ..... .24
76-304 Tuning Control Shaft ..... .08
80-209 Dial Cord Tension Spring ..... .03
80-345 Indicator Spring 1.00C
188-32 Retaining Ring ..... .07
59534 Indicator Lever and Bushing Assem. ..... .07
1189853 Dial Cord and Eyelet Assem. 1.42
20S10068 Dial Cord and Shutter Assem. (26-322) ..... .19
61M684 Pulley and Bracket Assem. .....

COILS AND CHOKES

95-804 1st. I. F. Transformer (T1) 1.39
95-805 2nd. I. F. Transformer (T2) 1.39
20S10083 Oscillator Coil Assem. (L3) ..... .75
20S10084 Detector Coil Assem. (L2) ..... .91

CONDENSERS

22-182 250 Mmfd. (C6) ..... 600 V. ..... .20
22-196 .01 Mfd. (C16) ..... 600 V. ..... .20
22-303 5 Mmfd. (C2) ..... 500 V. ..... .20
22-458 .006 Mfd. (C17) ..... 600 V. ..... .20
22-470 150 Mmfd. (C15) ..... 600 V. ..... .23
22-827 .1 Mfd. (C5) ..... 200 V. ..... .20
22-829 .05 Mfd. (C4) ..... 200 V. ..... .20
22-1017 .05 Mfd. (C22) ..... 200 V. ..... .20
22-1025 .15 Mfd. (C9) ..... 200 V. ..... .20
22-1120 .015 Mfd. (C23) ..... 400 V. ..... .20
22-1226 Oscillator Trimmer (C8) ..... .95
22-1352 Three Gang Variable (C1) 4.15
22-1451 .001 Mfd. (C14) ..... 600 V. .....
22-1443 Dry Electrolytic 40 - 40 - 20 - Mfd. - 150 V. .....
22-1516 5 Mmfd. (Alt. for 22-303) (C2) ..... 10 V. (C18, 19, 20 and 21) 2.00
x 200 Mfd. - 500 V. ..... .20

RESISTORS

63-271 1 Megohm (R14) ..... 1/4 Watt ..... .09
63-416 1500 Ohm (R11) ..... 1/2 Watt ..... .10
63-579 220 Ohm (R6) ..... 1/4 Watt ..... .09
63-580 330 Ohm (R15) ..... 1/4 Watt ..... .09
63-592 330M Ohm (R17) ..... 1/4 Watt ..... .09
63-600 2.2 Megohm (R7) ..... 1/4 Watt ..... .09
63-602 4.7 Megohm (R1) ..... 1/4 Watt ..... .09
63-644 22M Ohm (R2) ..... 1/4 Watt ..... .09
63-713 47M Ohm (R5) ..... 1/4 Watt Insl ..... .09
63-719 470M Ohm (R3) ..... 1/4 Watt Insl ..... .09
63-773 180M Ohm (R4) ..... 1/4 Watt Insl ..... .19
63-1097 870 Ohm W. W. (R16) ..... 1 Watt Insl ..... .24
63-1567 Volume Control and Sw. (R12) 1.81
63-1562 Candohm (Two 950 Ohm - 3W. Sections) (R9 and R10) ..... .85
63-1565 Candohm (Alt. for 63-1562) ..... .85
63-1366 Zipohm Resistor (140 Ohm 2 Watt) (R8) ..... .24

MISCELLANEOUS

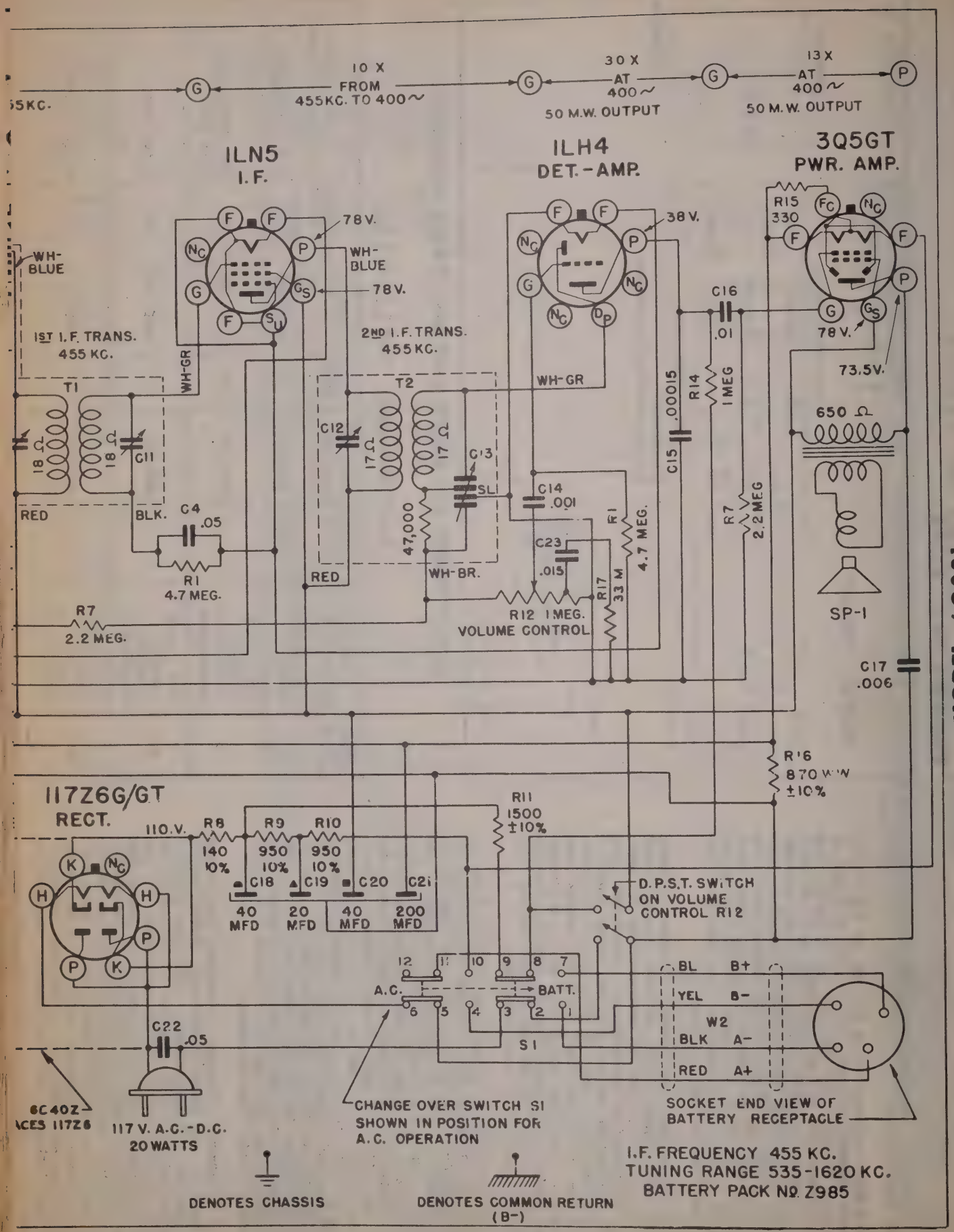
11-86 Line Cord and Plug 65
14-901 Model 001Y Portable Cabinet 18.25
15-51 Battery Cable Plug Cap ..... .09
36-27 Cabinet Handle (Includes 36-28 Insert) ..... .64
46-518 Tuning Control Knob ..... .07
46-577 Volume Control Knob ..... .07
49-51? 5 1/4" P. M. Speaker 9.00
208-512 Output Trans. 1.97
208-512 Cone and Voice Coil 1.73
Speed Nut ..... .01
54-211 Cabinet Front Panel 2.00
57-1017 Escutcheon 1.50
57-1018 # 5 x 3/8 Phillips B. H. Wood Screw ..... .01
70-111 # 4 - 40 x 1/4 Flat Hd. M. S. (Black Anodize) ..... .24C
71-87 Socket - Electrolytic Cond. ..... .03
78-274 Socket - Loktal (8 contact) ..... .19
78-371 Socket - Octal (8 contact) ..... .12
78-445 Socket - Loktal (7 contact) ..... .19
78-446 Socket - Battery Cable (4 Prong) ..... .13
78-543 Pin Jack Terminal Strip (on gang) ..... .10
83-1228 Power Change Over Sw. ..... .82
85-311 Black Felt Washer ..... .60C
93-553 Grille Cloth ..... .10
110-105 # 8 x 1" Phillips Countersunk Oval Hd. S. W. Screw ..... .03
112-290 #10/24 x 1" Washer Hd. M. S. (Handle Screw) ..... .03
112-403 Baffle Board ..... .05
139-54 Plug Button ..... .04
159-25 Snap Button ..... .01
159-49 Handle Ring (2 used) ..... .02
188-47 Dial Crystal ..... .24
192-107 Dial Crystal Gasket ..... .05
196-85 Instruction Book ..... .05
202-370 Complete Cabinet Front Panel Assem. 4.00
S13038

WAVEMAGNET PARTS

19-134 Wavemagnet Cable Clip ..... .05
197-13 Wavemagnet Suction Cup ..... .06
S10857 Wavemagnet Winding and Plate Assem. 3.75
S10862 Wavemagnet Cable Assem. 1.08
S10865 Wavemagnet Suction Cup Assem. (3 contact) ..... .14
S10866 Wavemagnet Mfg. Strip Assem. (3 contact) ..... .33
S10867 Wavemagnet Mfg. Strip Assem. (1 contact) ..... .13
S12528 Wavemagnet Suction Cup Assem. (Alt. for S10865) ..... .14

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

15M 2-22-47


10 X
FROM
455KC. TO 400~
30 X
AT
400~
50 M.W. OUTPUT
13 X
AT
400~
50 M.W. OUTPUT
ILN5
I.F.
ILH4
DET.-AMP.
3Q5GT
PWR. AMP.
78V.
WH-BLUE
78V.
38V.
R15
330
78V.
73.5V.
1ST I.F. TRANS.
455 KC.
2ND I.F. TRANS.
455 KC.
T1
T2
WH-GR
C16
.01
C15 .00015
R14
1 MEG
R7
2.2 MEG
650 Ω
SP-1
C11
C12
C13
SL
C14
.001
C23
.015
R1
4.7 MEG.
R17
33 M
47,000
RED
BLK.
C4
.05
R1
4.7 MEG.
WH-BR.
R12 1 MEG.
VOLUME CONTROL
R7
2.2 MEG.
C17
.006
R16
870 W.W.
±10%
117Z6G/GT
RECT.
110.V.
R8
140
10%
R9
950
10%
R10
950
10%
R11
1500
±10%
C18
40
MFD
C19
20
MFD
C20
40
MFD
C21
200
MFD
D.P.S.T. SWITCH
ON VOLUME
CONTROL R12
A.C.
BATT.
S1
C22
.05
BL B+
YEL B-
W2
BLK A-
RED A+
6C40Z
ACES 117Z6
117 V. A.C.-D.C.
20 WATTS
CHANGE OVER SWITCH S1
SHOWN IN POSITION FOR
A.C. OPERATION
SOCKET END VIEW OF
BATTERY RECEPTACLE
I.F. FREQUENCY 455 KC.
TUNING RANGE 535-1620 KC.
BATTERY PACK NO. Z985
DENOTES CHASSIS
DENOTES COMMON RETURN
(B-)

MODEL 6G001

PARTS LIST

DIAL ASSEMBLY

12-887	TUNING CONTROL SHAFT BRACKET
26-349	DIAL SCALE
46-518	TUNING & VOLUME CONTROL KNOB (2 USED)
46-573	SWITCH CONTROL KNOB (RED) (2 USED)
59-146	DIAL POINTER
59-167	ON-OFF INDICATOR
76-304	TUNING CONTROL SHAFT
80-209	DIAL CORD TENSION SPRING
80-421	INDICATOR SPRING
188-32	RETAINING RING (76-304)
192-112	DIAL CRYSTAL
S-9534	INDICATOR LEVER & BUSHING ASSEMBLY
S-9653	DIAL CORD & EYELET ASSEMBLY
MS-684	PULLEY & BRACKET ASSEMBLY

COILS AND CHOKES

95-804	1ST I.F. TRANSFORMER (T1)
95-805	2ND I.F. TRANSFORMER (T2)
S-8326	WAVE TRAP COIL ASSEMBLY (L5)
S-11591	ANTENNA LOADING COIL ASSEMBLY (L3)
S-11798	OSCILLATOR COIL ASSEMBLY(L6)
S-11800	PEAKING COIL ASSEMBLY (L4)
S-11801	ANTENNA COIL ASSEMBLY (L2)

CONDENSERS

22-147	500 MMFD. (C26) 600 V.
22-162	.0001 MFD. (C6) 500 V.
22-196	.01 MFD. (C18) 600 V.
22-458	.006 MFD. (C20) 600 V.
22-470	.00015 MFD. (C19) 600 V.
22-826	.01 MFD. (C27) 200 V.
22-827	.1 MFD. (C5) 200 V.
22-829	.05 MFD. (C4) 200 V.
22-1017	.05 MFD. (C25) 200 V.
22-1025	.15 MFD. (C11) 200 V.
22-1120	.015 MFD. (C28) 400 V.
22-1388	SINGLE SECTION TRIMMER (WAVE-TRAP) (85 MMFD.) (C7)
22-1427	TWO GANG VARIABLE (C1)
22-1428	TWO SECTION TRIMMER (ANT.) 2-20 MMF. (C2 & C3)
22-1429	THREE SECTION TRIMMER (OSC.) (C8,C9 & C10)
22-1431	.001 MFD. (C16) 600 V.
22-1443	DRY ELECTROLYTIC 40-40-20 MFD.-150 V.-200 MFD. 10 V. (C21,C22,C23 & C24)
22-1444	.001 MFD. 200V. (C17)

RESISTORS

63-271	1 MEGOHM (R9) 1/4 WATT
63-418	1500 OHM (R15) 1/2 WATT
63-580	330 OHM (R10) 1/4 WATT
63-590	15000 OHM (R2) 1/4 WATT
63-592	33000 OHM (R16) 1/4 WATT
63-600	2.2 MEGOHM (R6) 1/4 WATT
63-602	4.7 MEGOHM (R1) 1/4 WATT
63-708	6800 OHM (INSULATED) (R17) 1/4 WATT
63-713	47000 OHM (INSULATED) (R5) 1/4 WATT
63-715	100000 OHM (INSULATED) (R3) 1/4 WATT
63-773	180000 OHM (INSULATED) (R9) 1/4 WATT
63-1097	870 OHM W.W. (INSULATED) (R11) 1 WATT
63-1362	2 SECTION CANDOHM (OR 63-1365) .3 WATT (R13 & R14)
63-1366	140 OHM ZIPOHM (R12) 2½ WATT
63-1537	VOLUME CONTROL & SWITCH (R7)

MISCELLANEOUS

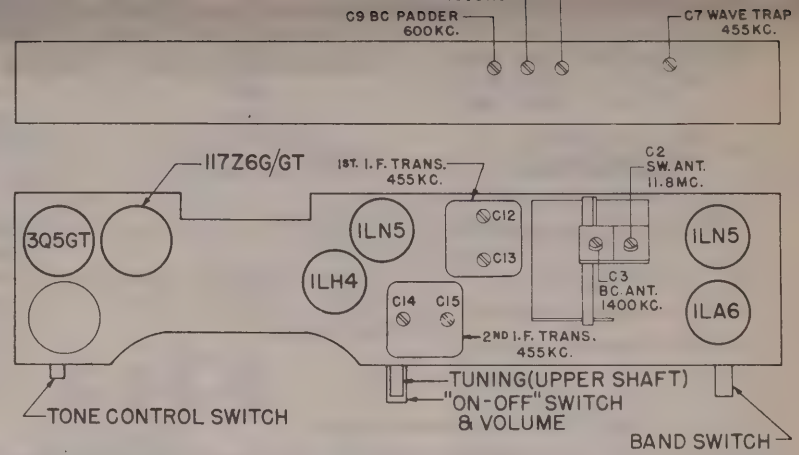
11-70	LINE CORD & PLUG (OR 11-90)
12-1134	TELESCOPIC ANTENNA SUPPORT BRACKET
15-51	PLUG CAP
19-125	ANTENNA MOUNTING CLIP
19-148	ANTENNA MOUNTING CLIP
36-37	CABINET HANDLE & INSERT (36-38)
49-512	5½" P.M. SPEAKER 206-512 OUTPUT TRANSFORMER 208-512 CONE & VOICE COIL
54-211	SPEED NUT (3 USED)
57-1111	FRONT PANEL
57-1121	ESCUTCHEON
64-98	BRASS EYELET
64-99	BRASS EYELET (ANT. LEAD) (2 USED)
700-111	#5 X 3/8" PHILLIPS B.H. WOOD SCREW (FRONT PANEL MTG.)
78-274	ELECTROLYTIC SOCKET
78-371	LOKTAL BASE TUBE SOCKET
78-401	LOKTAL BASE TUBE SOCKET (OR 78-596 OR 78-729)
78-543	FOUR PRONG FEMALE SOCKET (BATTERY CABLE)
78-611	OCTAL BASE TUBE SOCKET
78-671	OCTAL BASE TUBE SOCKET
83-1401	FELT STRIP (USED ON 46-573)
85-311	POWER CHANGE-OVER SWITCH - (244705) (S3)
85-364	BAND SWITCH (S1)
85-368	TONE CONTROL SWITCH (S2)
93-485	COUNTERSUNK WASHER (2 USED) (STATUARY BRONZE) (CHASSIS MTG.)
93-553	BLACK FELT WASHER (2 USED)
110-105	GRILLE CLOTH
112-236	ORNAMENTAL HD. M.SC. (ANT. MTG.) (2 USED)
112-290	CHASSIS MTG. SCREW (2 USED)
112-403	10-24 X 1" WASHER HD. M.S. (HANDLE MTG.) (2 USED)
125-17	RUBBER GROMMET (GANG MTG. & ANT. MTG.)
139-54	BAFFLE BOARD
156-19	FRICTION CATCH (2 USED)
156-20	DOOR LATCH - UPPER HALF
156-21	DOOR LATCH - LOWER HALF
157-7	STRIKE FASTENER (2 USED)
184-7	BALL TIP FOR TELESCOPIC ANTENNA
188-47	HANDLE RING (2 USED)
202-400	INSTRUCTION BOOK
S-11802	ANTENNA TRIMMER BRKT. & PIN JACK ASSEM.
S-11820	TELESCOPIC ANT. ASSEM. (COMPLETE)
S-13719	TONE SWITCH KNOB YOKE & PLATE ASSEM.

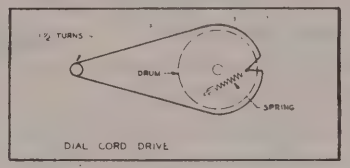
WAVEMAGNET PARTS

19-134	WAVEMAGNET CABLE CLIP
S-10862	WAVEMAGNET CABLE ASSEMBLY
S-10865	WAVEMAGNET SUCTION CUP ASSEM. (OR S-12528) (2 USED)
S-10867	WAVEMAGNET MTG. STRIP ASSEMBLY (SINGLE SNAP)
S-11928	WAVEMAGNET WINDING & PLATE ASSEMBLY (L1)
S-12382	WAVEMAGNET MTG. STRIP ASSEMBLY (THREE SNAP)

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

3-10-47





DIAL CABLE DRAWING

TUBE TRIMMER LOCATION

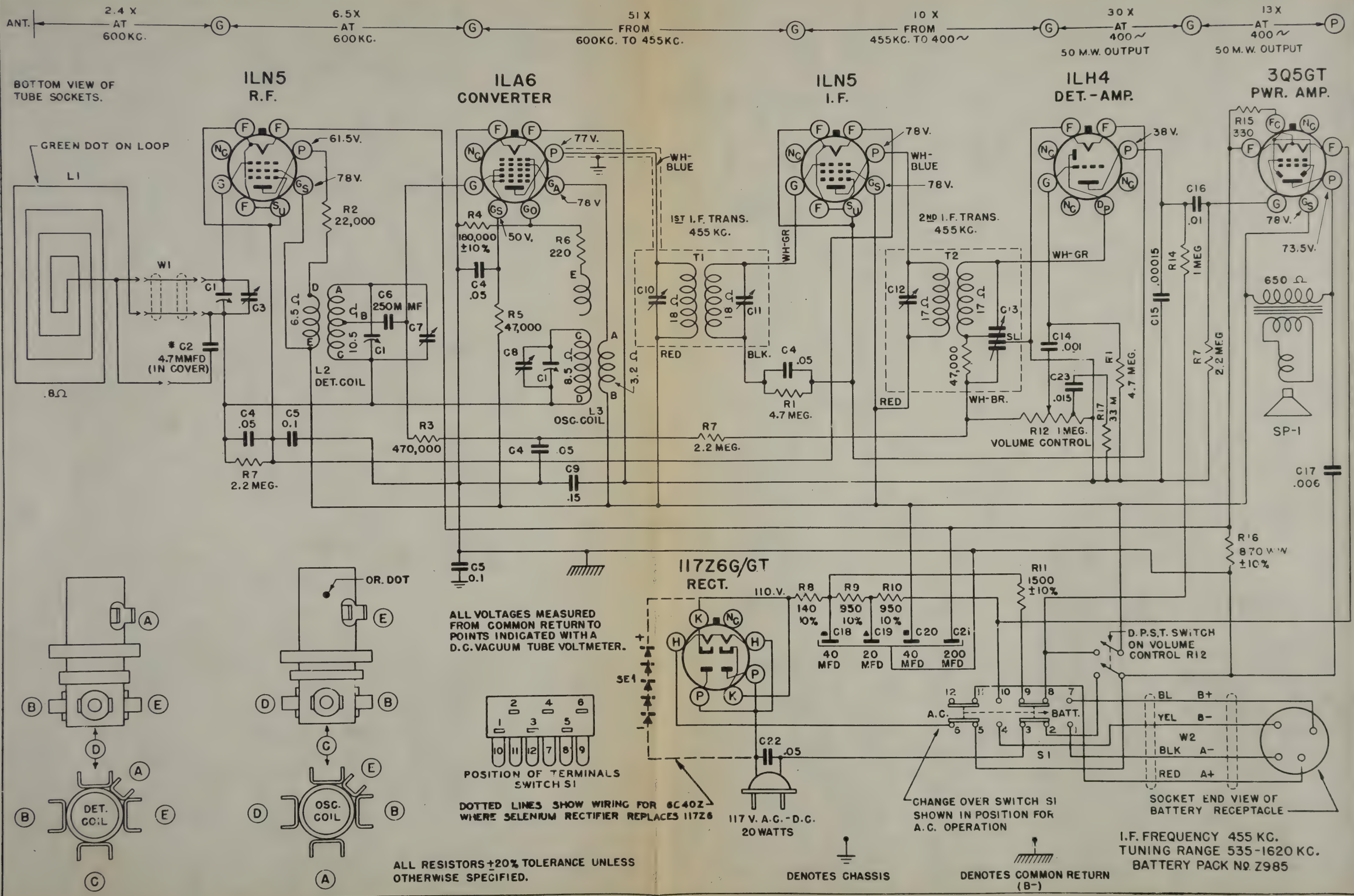
TO THE SERVICEMAN: THE 6C41 CHASSIS IS A AC,DC OR BATTERY OPERATED SUPERHETERODYNE WITH A STAGE OF RF AMPLIFICATION AND TWO TUNING RANGES, 935 TO 1620KC AND 9.4 TO 12.1 MC. THE CHASSIS IS ISOLATED FROM THE DC CIRCUITS, AND ALL MEASUREMENTS MUST BE MADE FROM A COMMON NEGATIVE POINT. THE MOST CONVENIENT PLACE TO REACH THIS NEGATIVE POINT IS THE TERMINAL STRIP TO WHICH C5 IS CONNECTED. THE DC RESISTANCE FROM CHASSIS TO ANY CIRCUIT MUST BE ALMOST INFINITE. IF ANY CIRCUIT BECOMES GROUNDED A HUM WILL DEVELOP. MICROPHONIC TUBES WILL CAUSE AUDIO HOWL. CHECK 1LA6.

THE WAVEMAGNET IS CONNECTED TO THE CHASSIS THROUGH THE HINGES IN THE CABINET, SNAPS AND FLEXIBLE LEADS. IF THE RF BECOMES WEAK OR DEAD, CHECK THE RESISTANCE OF THE WAVEMAGNET AT TUNING GANG. THE DC RESISTANCE ACROSS THE TWO LEADS SHOULD BE APPROXIMATELY 1 OHM. IF THE CIRCUIT IS OPEN, REMOVE THE TWO SCREWS WHICH HOLD THE HANDLE AND TOP PANEL AND REMOVE THE TOP PANEL. WHEN THE TOP IS REMOVED, THE WAVEMAGNET CONNECTING LEADS WILL BE VISIBLE FOR INSPECTION. ALSO LOOSEN THE SNAP-ON SOCKET AND CHECK FOR SHORTED OR BROKEN LEADS.

IF ALIGNMENT: REMOVE THE CHASSIS FROM THE CABINET AND ARRANGE THE UNITS SO THAT THE WAVEMAGNET CAN BE PLUGGED IN. THROUGH A .1MFD DUMMY ANTENNA, FEED A 455 KC SIGNAL TO THE CONVERTER GRID. CONNECT AN OUTPUT METER ACROSS THE VOICE COIL OF THE SPEAKER (TWO LUGS PROVIDED) AND ADJUST C12,C13,C14 AND C15 FOR MAXIMUM INDICATION ON THE OUTPUT METER. ALWAYS KEEP THE SIGNAL OUTPUT FROM THE GENERATOR JUST HIGH ENOUGH TO GET INDICATION ON THE METER. TOO MUCH SIGNAL WILL CAUSE LOADING AND INACCURATE ALIGNMENT. THE WAVE-TRAP IS ADJUSTED BY COUPLING THE 455KC SIGNAL TO THE WAVEMAGNET THROUGH A ONE TURN LOOP AND ADJUSTING C7 FOR MINIMUM INDICATION ON THE OUTPUT METER.

RF ALIGNMENT: SET THE BAND SWITCH TO SHORT WAVE AND THROUGH A SINGLE TURN LOOP LOOSELY COUPLE A 11.8 MC SIGNAL TO THE WAVEROD. C8 AND C2 ARE ADJUSTED TO SCALE AND MAXIMUM OUTPUT. SET THE BAND SWITCH TO STANDARD BROADCAST, SIGNAL GENERATOR TO 1600KC AND LOOSELY COUPLE A ONE TURN LOOP TO THE WAVEMAGNET. C10 IS ADJUSTED TO SCALE. SET SIGNAL GENERATOR AND DIAL SCALE TO 1400 KC AND ADJUST C3 FOR MAXIMUM SIGNAL. SET SIGNAL GENERATOR AND DIAL TO 600 AND WHILE ROCKING THE GANG ADJUST C9 TO MAXIMUM A SLIGHT RE-ADJUSTMENT OF C2 AT 11.8 MC AND C3 AT 1400KC MAY BE NECESSARY AFTER THE CHASSIS IS INSTALLED IN THE CABINET.

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	CONVERTER GRID	5 MFD	455 KC	BC	600 KC	C12 C13, C14 C15	ALIGN I.F
2	ONE TURN LOOSELY COUPLED TO WAVEMAGNET		455 KC	BC	600 KC	C7	ADJUST WAVETRAP TO TO MINIMUM
3	ONE TURN LOOSELY	EXTEND WAVEROD FULL LENGTH	11.8 MC	SW	11.8 MC	C8	SET OSCILLATOR TO SCALE
4	COUPLED TO WAVEROD		11.8 MC	SW	11.8 MC	C2	ALIGN WAVEROD
5	ONE TURN LOOSELY COUPLED TO WAVEMAGNET		1600 KC	BC	1600 KC	C10	SET OSCILLATOR TO SCALE
6			1400 KC	BC	1400 KC	C3	ALIGN WAVEMAGNET
7			600 KC	BC	ROCK GANG AT 600 KC	C9	ADJUST PADDER



MODEL 6G001
CHASSIS No. 6C40

MODEL 6G004Y—CHASSIS No. 6C41

PARTS LIST

DIAL ASSEMBLY

12-887	TUNING CONTROL SHAFT BRACKET
26-349	DIAL SCALE
46-518	TUNING & VOLUME CONTROL KNOB (2 USED)
46-573	SWITCH CONTROL KNOB (RED) (2 USED)
59-146	DIAL POINTER
59-167	ON-OFF INDICATOR
76-304	TUNING CONTROL SHAFT
80-209	DIAL CORD TENSION SPRING
80-421	INDICATOR SPRING
188-32	RETAINING RING (76-304)
192-112	DIAL CRYSTAL
S-9534	INDICATOR LEVER & BUSHING ASSEMBLY
S-9653	DIAL CORD & EYELET ASSEMBLY
MS-684	PULLEY & BRACKET ASSEMBLY

COILS AND CHOKES

95-804	1ST I.F. TRANSFORMER (T1)
95-805	2ND I.F. TRANSFORMER (T2)
S-8326	WAVE TRAP COIL ASSEMBLY (L5)
S-11591	ANTENNA LOADING COIL ASSEMBLY (L3)
S-11798	OSCILLATOR COIL ASSEMBLY(L6)
S-11800	PEAKING COIL ASSEMBLY (L4)
S-11801	ANTENNA COIL ASSEMBLY (L2)

CONDENSERS

22-147	500 MMFD. (C26) 600 V.
22-162	.0001 MFD. (C6) 500 V.
22-196	.01 MFD. (C18) 600 V.
22-458	.006 MFD. (C20) 600 V.
22-470	.00015 MFD. (C19) 600 V.
22-826	.01 MFD. (C27) 200 V.
22-827	.1 MFD. (C5) 200 V.
22-829	.05 MFD. (C4) 200 V.
22-1017	.05 MFD. (C25) 200 V.
22-1025	.15 MFD. (C11) 200 V.
22-1120	.015 MFD. (C28) 400 V.
22-1388	SINGLE SECTION TRIMMER (WAVE-TRAP) (85 MMFD.) (C7)
22-1427	TWO GANG VARIABLE (C1)
22-1428	TWO SECTION TRIMMER (ANT.) 2-20 MMF. (C2 & C3)
22-1429	THREE SECTION TRIMMER (OSC.) (C8,C9 & C10)
22-1431	.001 MFD. (C16) 600 V.
22-1443	DRY ELECTROLYTIC 40-40-20 MFD.-150 V.-200 MFD. 10 V. (C21,C22,C23 & C24)
22-1444	.001 MFD. 200V. (C17)

RESISTORS

63-271	1 MEGOHM (R9) 1/4 WATT
63-418	1500 OHM (R15) 1/2 WATT
63-580	330 OHM (R10) 1/4 WATT
63-590	15000 OHM (R2) 1/4 WATT
63-592	33000 OHM (R16) 1/4 WATT
63-600	2.2 MEGOHM (R6) 1/4 WATT
63-602	4.7 MEGOHM (R1) 1/4 WATT
63-708	6800 OHM (INSULATED) (R17) 1/4 WATT
63-713	47000 OHM (INSULATED) (R5) 1/4 WATT
63-715	100000 OHM (INSULATED) (R3) 1/4 WATT
63-773	180000 OHM (INSULATED) (R9) 1/4 WATT
63-1097	870 OHM W.W. (INSULATED) (R11) 1 WATT
63-1362	2 SECTION CANDOHM (OR 63-1365) .3 WATT (R13 & R14)
63-1366	140 OHM ZIPOHM (R12) 2½ WATT
63-1537	VOLUME CONTROL & SWITCH (R7)

MISCELLANEOUS

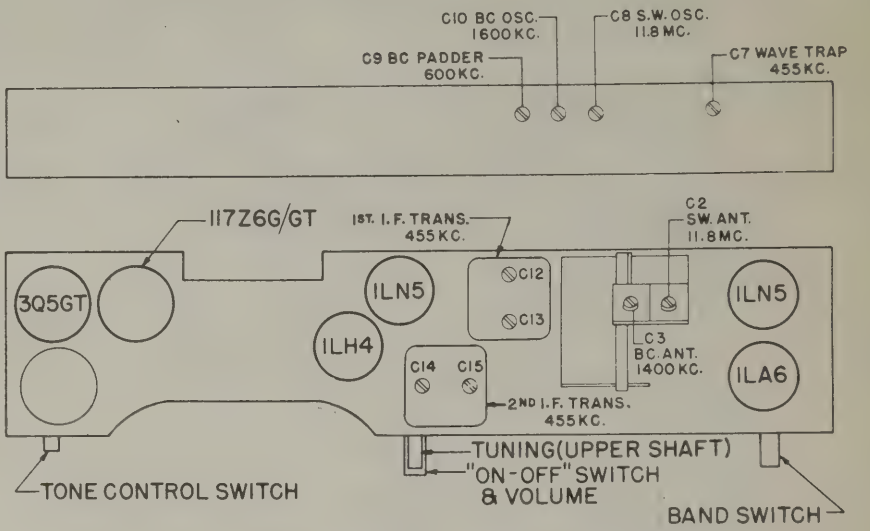
11-70	LINE CORD & PLUG (OR 11-90)
12-1134	TELESCOPIC ANTENNA SUPPORT BRACKET
15-51	PLUG CAP
19-125	ANTENNA MOUNTING CLIP
19-148	ANTENNA MOUNTING CLIP
36-37	CABINET HANDLE & INSERT (36-38)
49-512	5½" P.M. SPEAKER 206-512 OUTPUT TRANSFORMER 208-512 CONE & VOICE COIL
54-211	SPEED NUT (3 USED)
57-1111	FRONT PANEL
57-1121	ESCUTCHEON
64-98	BRASS EYELET
64-99	BRASS EYELET (ANT. LEAD) (2 USED)
700-111	#5 X 3/8" PHILLIPS B.H. WOOD SCREW (FRONT PANEL MTG.)
78-274	ELECTROLYTIC SOCKET
78-371	LOKTAL BASE TUBE SOCKET
78-401	LOKTAL BASE TUBE SOCKET (OR 78-596 OR 78-729)
78-543	FOUR PRONG FEMALE SOCKET (BATTERY CABLE)
78-611	OCTAL BASE TUBE SOCKET
78-671	OCTAL BASE TUBE SOCKET
83-1401	FELT STRIP (USED ON 46-573)
85-311	POWER CHANGE-OVER SWITCH - (244705) (S3)
85-364	BAND SWITCH (S1)
85-368	TONE CONTROL SWITCH (S2)
93-485	COUNTERSUNK WASHER (2 USED) (STATUARY BRONZE) (CHASSIS MTG.)
93-553	BLACK FELT WASHER (2 USED)
110-105	GRILLE CLOTH
112-236	ORNAMENTAL HD. M.SC. (ANT. MTG.) (2 USED)
112-290	CHASSIS MTG. SCREW (2 USED)
112-403	10-24 X 1" WASHER HD. M.S. (HANDLE MTG.) (2 USED)
125-17	RUBBER GROMMET (GANG MTG. & ANT. MTG.)
139-54	BAFFLE BOARD
156-19	FRICTION CATCH (2 USED)
156-20	DOOR LATCH - UPPER HALF
156-21	DOOR LATCH - LOWER HALF
157-7	STRIKE FASTENER (2 USED)
184-7	BALL TIP FOR TELESCOPIC ANTENNA
188-47	HANDLE RING (2 USED)
202-400	INSTRUCTION BOOK
S-11802	ANTENNA TRIMMER BRKT. & PIN JACK ASSEM.
S-11820	TELESCOPIC ANT. ASSEM. (COMPLETE)
S-13719	TONE SWITCH KNOB YOKE & PLATE ASSEM.

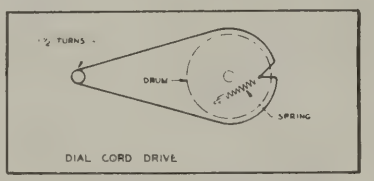
WAVEMAGNET PARTS

19-134	WAVEMAGNET CABLE CLIP
S-10862	WAVEMAGNET CABLE ASSEMBLY
S-10865	WAVEMAGNET SUCTION CUP ASSEM. (OR S-12528) (2 USED)
S-10867	WAVEMAGNET MTG. STRIP ASSEMBLY (SINGLE SNAP)
S-11928	WAVEMAGNET WINDING & PLATE ASSEMBLY (L1)
S-12382	WAVEMAGNET MTG. STRIP ASSEMBLY (THREE SNAP)

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

3-10-47





DIAL CABLE DRAWING

TUBE TRIMMER LOCATION

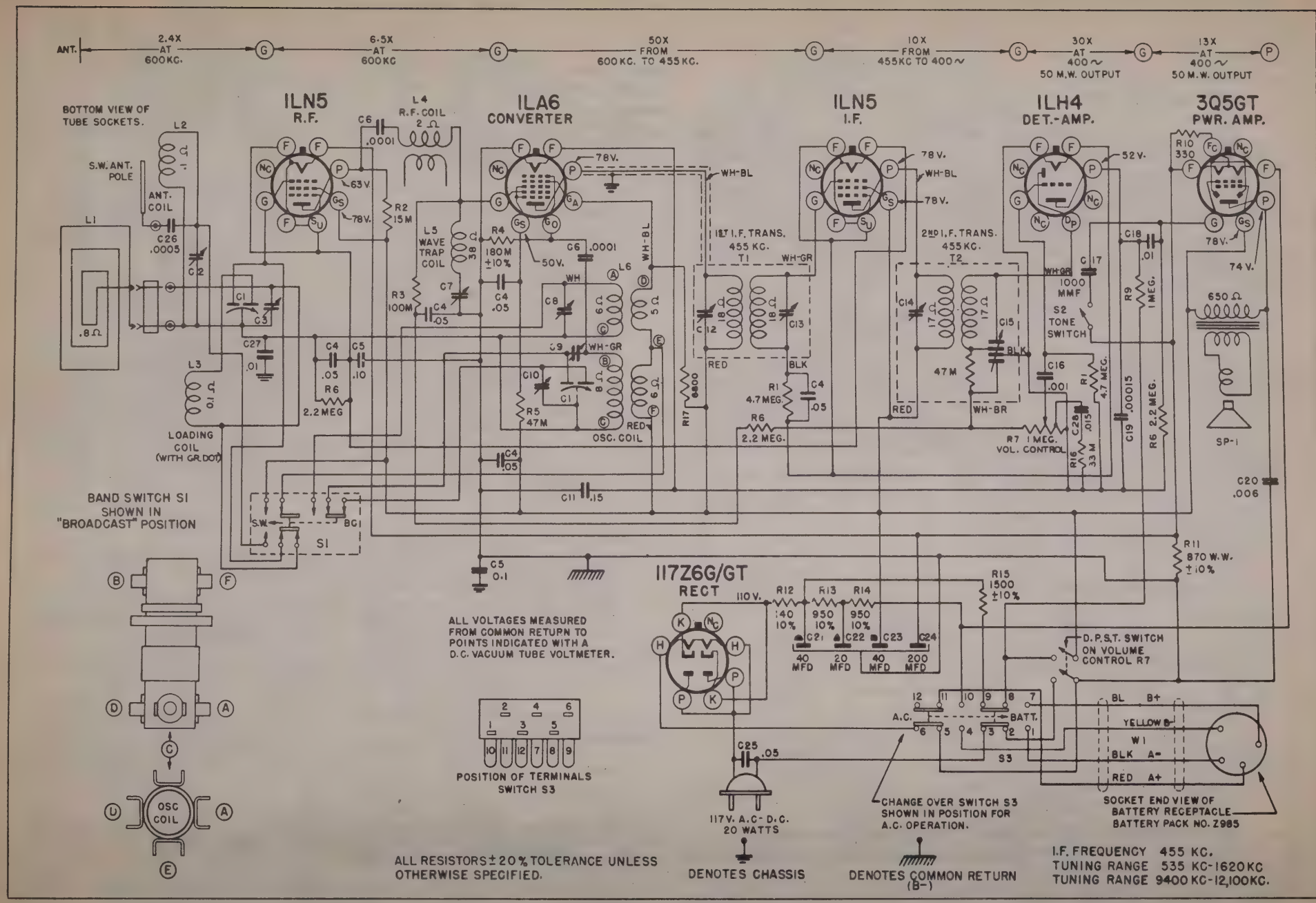
TO THE SERVICEMAN: The 6C41 chassis is a AC,DC or battery operated superheterodyne with a stage of RF amplification and two tuning ranges, 935 to 1620KC and 9.4 to 12.1 MC. The chassis is isolated from the DC circuits, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the terminal strip to which C5 is connected. The DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will develop. Microphonic tubes will cause audio howl. Check 1LA6.

The Wavemagnet is connected to the chassis through the hinges in the cabinet, snaps and flexible leads. If the RF becomes weak or dead, check the resistance of the Wavemagnet at tuning gang. The DC resistance across the two leads should be approximately 1 ohm. If the circuit is open, remove the two screws which hold the handle and top panel and remove the top panel. When the top is removed, the Wavemagnet connecting leads will be visible for inspection. Also loosen the snap-on socket and check for shorted or broken leads.

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the Wavemagnet can be plugged in. Through a .1mfd dummy antenna, feed a 455 KC signal to the converter grid. Connect an output meter across the voice coil of the speaker (two lugs provided) and adjust C12,C13,C14 and C15 for maximum indication on the output meter. Always keep the signal output from the generator just high enough to get indication on the meter. Too much signal will cause loading and inaccurate alignment. The wave-trap is adjusted by coupling the 455KC signal to the Wavemagnet through a one turn loop and adjusting C7 for minimum indication on the output meter.

RF Alignment: Set the band switch to short wave and through a single turn loop loosely couple a 11.8 MC signal to the Waverod. C8 and C2 are adjusted to scale and maximum output. Set the band switch to standard Broadcast, signal generator to 1600KC and loosely couple a one turn loop to the Wavemagnet. C10 is adjusted to scale. Set signal generator and dial scale to 1400 KC and adjust C3 for maximum signal. Set signal generator and dial to 600 and while rocking the gang adjust C9 to maximum. A slight re-adjustment of C2 at 11.8 MC and C3 at 1400KC may be necessary after the chassis is installed in the cabinet.

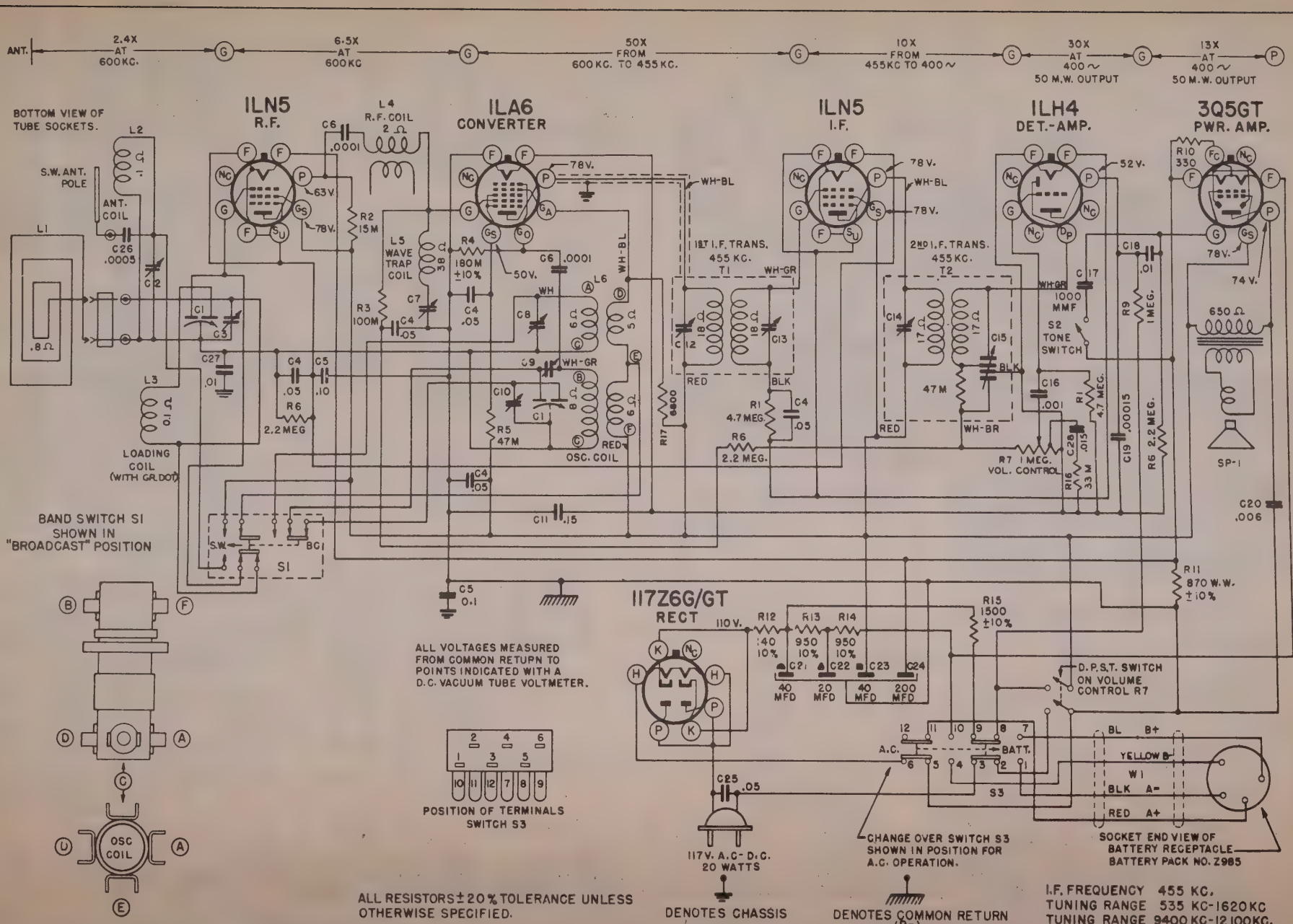
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	CONVERTER GRID	5 MFD	455 KC	BC	600 KC	C12 C13, C14 C15	ALIGN I.F
2	ONE TURN LOOSELY COUPLED TO WAVEMAGNET		455 KC	BC	600 KC	C7	ADJUST WAVETRAP TO TO MINIMUM
3	ONE TURN LOOSELY COUPLED TO WAVEROD	EXTEND WAVEROD FULL LENGTH	11.8 MC	SW	11.8 MC	C8	SET OSCILLATOR TO SCALE
4			11.8 MC	SW	11.8 MC	C2	ALIGN WAVEROD
5	ONE TURN LOOSELY COUPLED TO WAVEMAGNET		1600 KC	BC	1600 KC	C10	SET OSCILLATOR TO SCALE
6			1400 KC	BC	1400 KC	C3	ALIGN WAVEMAGNET
7			600 KC	BC	ROCK GANG AT 600 KC	C9	ADJUST PADDER



MODEL 6G004Y—CHASSIS No. 6C41

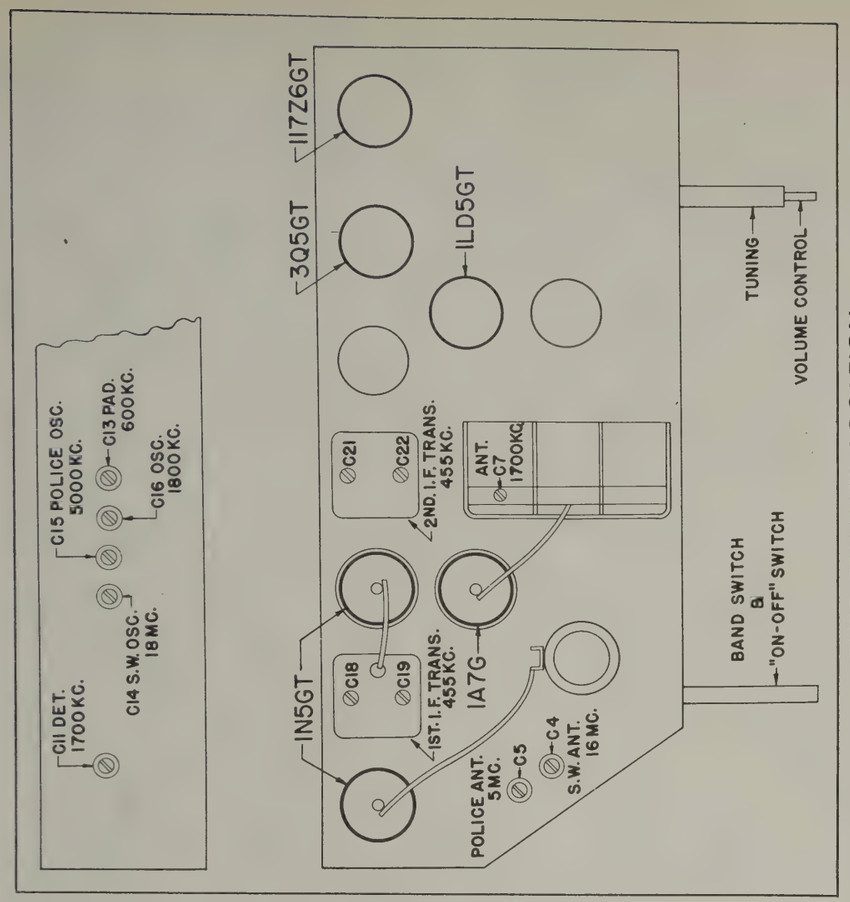
PART NO.	REF. NO.	DESCRIPTION	PRICE
		RADIO ESCUTCHEON PARTS	
S-9995		Radiorgan Escutcheon & Knob Assem. L.H. (Complete)	1.20
S-9996		Radiorgan Escutcheon & Knob Assem. R.H. (Complete)	1.20
MS-660		Bracket Assembly	.25
S-9590		Knob & Eyelet Assem. (3 used on L.H., 1 on R.H.)	.12
S-9591		Knob & Eyelet Assembly (2 used on R.H. only)	.12
57-911		Tenite Escutcheon (Black) (1 used on L.H. only)	.36
57-912		Tenite Escutcheon (Black) (1 used on R.H. only)	.36
76-337		Latch Shaft	.03
76-338		Knob Shaft	.04
80-264		Latch Spring	.72C
114-159		#6 x 1/4" Hex Hd. Self Tapping Screw (2 used)	.72C
156-10		Latch	.36C
		MISCELLANEOUS	
11-68		Line Cord & Plug (8 ft. long)	.65
12-782		Volume Control Mounting Bracket	.05
12-787		Tuning Sleeve Support Bracket	.04
12-1082		Antenna Rod Mounting Bracket	.06
15-34		Socket Cap (or 15-67) (Battery Cable)	.07
17-67		Antenna Rod Retaining Clamp	.08
19-77		Cable Retaining Clamp	.01
46-579		Band Selector Switch Knob	.20
49-464	SP1	8" P.M. Speaker	10.52
		206-464 Output Transformer	1.97
		208-464 Cone & Voice Coil	2.63
57-11A		Antenna Lead Marker	.03
57-11G		Ground Lead Marker	.03
57-905		Dial Escutcheon (or 57-1112) (Part of S-9580 or S-11777)	2.41
57-1103		Antenna Knob Escutcheon	.70
70-124		#2 x 3/8" Oval Hd. Wood Screw (Ant. Esc. Mtg.)	1.70C
72-58		#2 x 3/8" Flat Hd. Wood Screw (Dial Esc. Mtg.)	.02
78-190		Speaker Plug Socket	.12
78-229		Electrolytic Capacitor Socket	.03
78-396		Four Contact Socket (Battery Cable)	.12
78-446		Loktal Base Tube Socket (7 contact)	.19
78-611		Octal Base Tube Socket (8 contact)	.12
78-671		Octal Base Tube Socket	.12
85-171	S5	Power Switch	.31
85-303	S1	Antenna Swtich	.35
85-366	S2	Band Selector Switch	2.00
93-215		Rubber Washer (Chassis Mtg.)	.07
112-56		#6 x 1/4" Hex.Hd.Self Tapping Screw (Radiogran Switch Mtg.)	.55C
114-40		#10-32 x 7/8" Hex Washer Hd.M.S.Steel (Chassis Mtg.) (3 used)	.72C
114-128		#10 x 1-1/16" Hex Washer Hd.Self Tapping Screw (Chassis Mtg.) (1 used)	1.81C
125-17		Rubber Grommet	.03
126-379		Tube Shield (for GT type)	.07
126-382		Tube Shield	.08
192-68		Dial Escutcheon Glass (Part of S-11777 or S-9580)	.43
196-47		Dial Escutcheon Gasket(" " " " ")	.19
202-398		Instruction Book	.25
S-8540		Dummy Knob & Set Screw Assembly (46-350)	.24
S-9580		Dial Escutcheon Assembly (or S-11777)	3.01
S-9595	S3,4	Radiorgan Strip & Contact Assembly (2 used)	.31
S-9816		Tuning Control Knob & Set Screw Assembly	.30
S-11251		Telescopic Antenna Assembly	7.85
S-11899		Volume Control Knob Assembly (46-578)	.26

Prices subject to change without notice 25 5-1-47



MODEL 6G004Y—**CHASSIS** No. 6C41

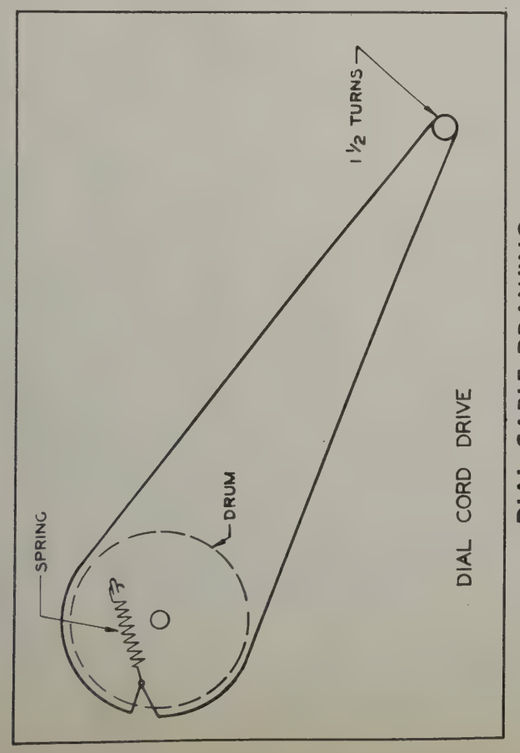
MODEL 6G038
CHASSIS No. 6C50



TUBE TRIMMER LOCATION

ALIGNMENT PROCEDURE

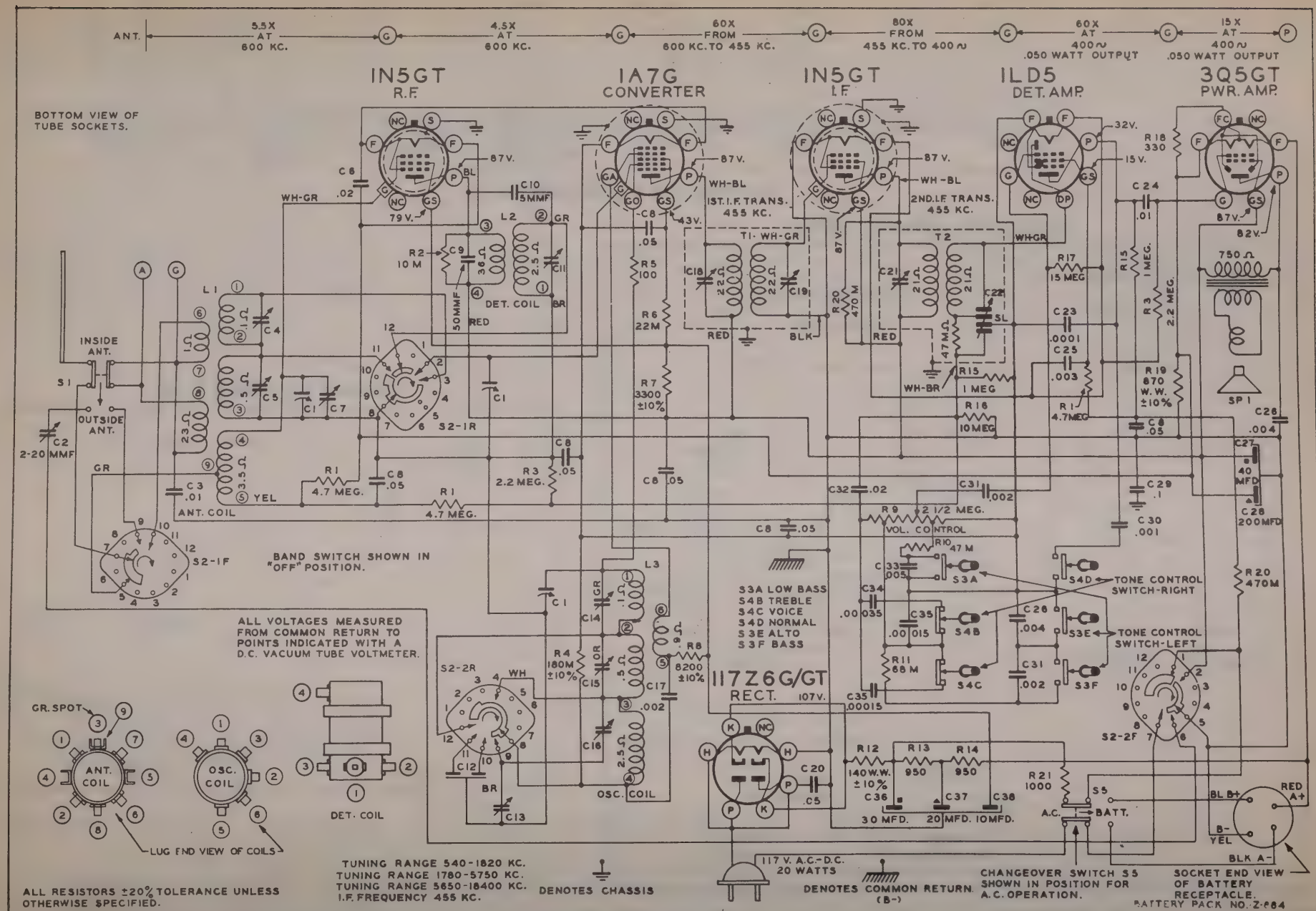
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter grid	.5 mfd	455 Kc.	600 Kc.	C18,C19,C21,C22	Align I.F.
2	One turn		18 Mc	18 Mc	C14	Adjust oscillator to scale
3			16 Mc	16 Mc	C4	Adjust for max.
4	Loosely		5 Mc	5 Mc	C15	Adjust oscillator to scale
5	Coupled		5 Mc	5 Mc	C5	Adjust for max.
6	To		1800 Kc	1800 Kc	C16	Adjust oscillator to scale
7	Waverod		1700 Kc	1700 Kc	C11 & C7	Adjust for max.
8			600 Kc	600 Kc	C13	Rock gang and adjust for max.



DIAL CABLE DRAWING

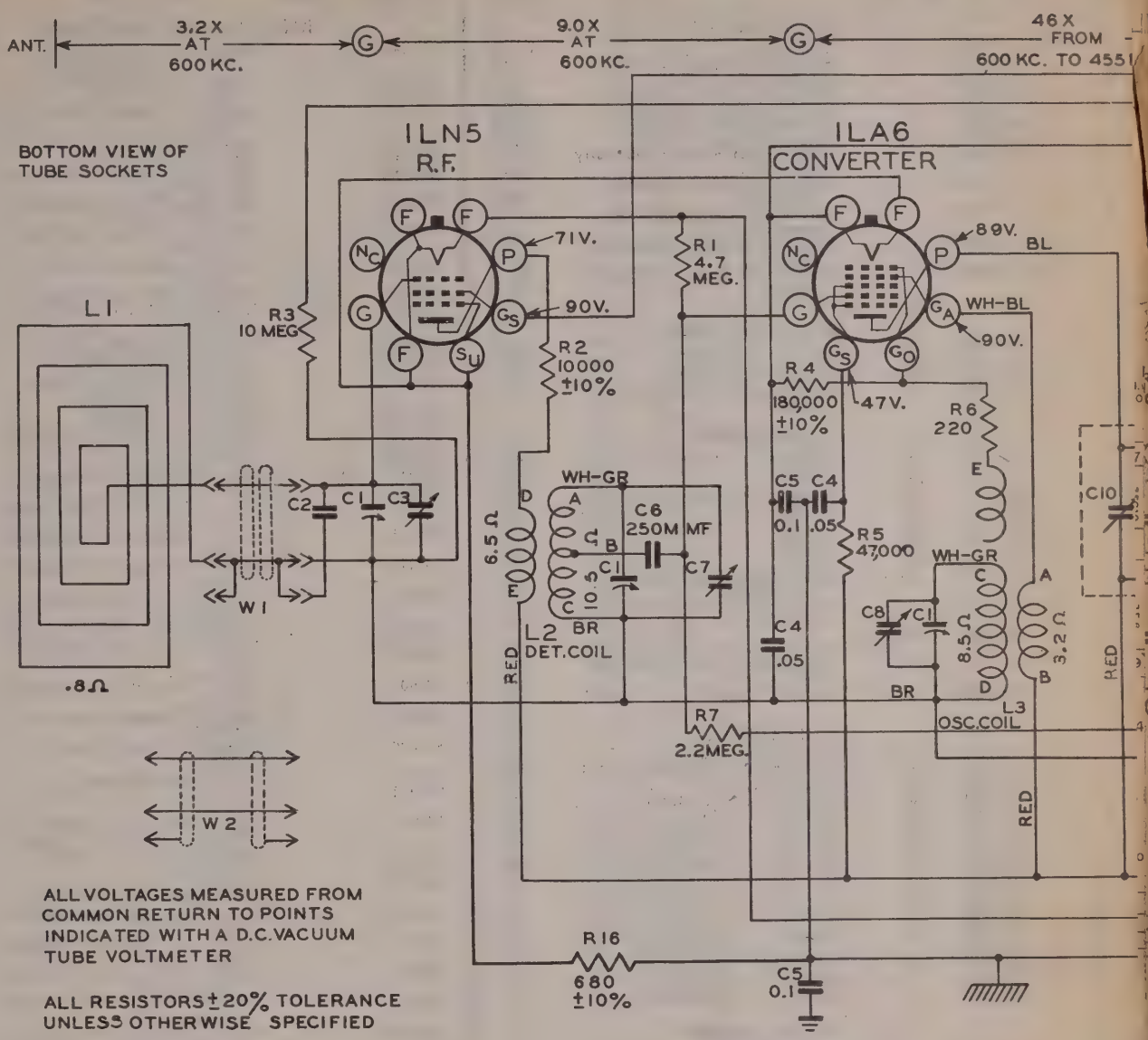
PARTS LIST

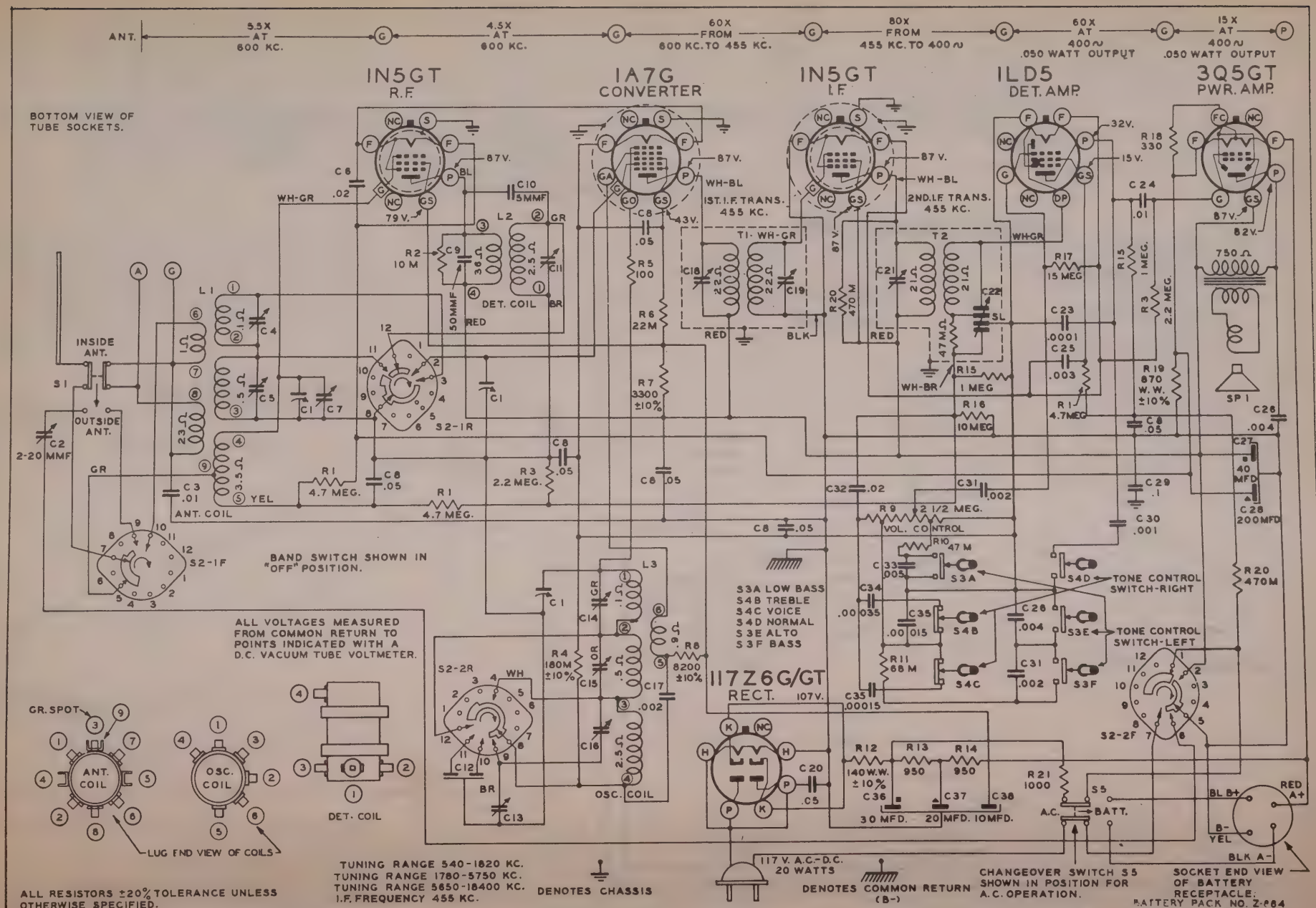
PART NO.	REF. NO.	DESCRIPTION		PRICE
		DIAL ASSEMBLY		
59-121		Dial pointer		.19
76-305		Tuning Control shaft		.12
80-69		Dial Cord Tension Spring		.02
80-227		Tuning Shaft Tension Spring		.02
93-482		Black Bakelite Washer (used with 59-121)		.72C
188-27		Retaining Ring (76-305)		1.20C
S-9643		Dial Scale & Indicator Assembly (26-293)		1.20
S-9758		Dial Cord Assembly		.07
MS-586		Pulley & Bracket Assembly		.12
		COILS & CHOKES		
95-821	T1	1st I.F. Transformer		1.77
95-822	T2	2nd I.F. Transformer		1.77
S-9689	L3	Oscillator Coil & Wire Assembly		1.26
S-9690	L2	Detector Coil Assembly		1.04
S-11815	L1	Antenna Coil Assembly		1.65
		CONDENSERS		
22-162	C23	.0001 Mfd	500 Volt.	.20
22-196	C24	.01 Mfd	600 Volt.	.20
22-229	C33	.005 Mfd	600 Volt.	.20
22-289	C9	50 Mmfd	500 Volt.	.20
22-303	C10	5 Mmfd	500 Volt.	.20
22-326	C25	.003 Mfd	400 Volt.	.20
22-327	C6	.02 Mfd	200 Volt.	.20
22-358	C17	.002 Mfd	600 Volt.	.38
22-448	C26	.004 Mfd	600 Volt.	.20
22-470	C35	.00015 Mfd	600 Volt.	.20
22-492	C30	.002 Mfd	600 Volt.	.20
22-827	C29	.1 Mfd	200 Volt.	.23
22-829	C8	.05 Mfd	200 Volt.	.20
22-830	C32	.02 Mfd	600 Volt.	.20
22-887	C31	.001 Mfd	600 Volt.	.20
22-930	C12	Dual unit padder		.83
22-954	C34	.00035 Mfd	600 Volt.	.16
22-1017	C20	.05 Mfd	400 Volt.	.20
22-1047	C36,37,38	10-20-30 Mfd. Dry Electrolytic	150 Volt.	1.63
22-1144	C13,14,15,16	Four Section Ceramic Trimmer		.83
22-1183	C3	.01 Mfd	400 Volt.	.20
22-1217	C1	Three Gang Variable		4.48
22-1230	C4,C5	Two Section Ceramic Trimmer		.38
22-1234	C27,28	200 Mfd.- 10 V. x 40 Mfc. 150 V. Dry Electrolytic		1.92
22-1421	C2,C11	Trimmer Capacitor		.40
		RESISTORS		
63-271	R15	1 Megohm	1/4 Watt.	.09
63-577	R5	100 Ohm	1/4 Watt.	.09
63-580	R18	330 Ohm	1/4 Watt.	.09
63-589	R2	10,000 Ohm	1/4 Watt.	.09
63-591	R6	22,000 Ohm	1/4 Watt.	.09
63-593	R10	47,000 Ohm	1/4 Watt.	.09
63-594	R11	68,000 Ohm	1/4 Watt.	.09
63-597	R20	470,000 Ohm	1/4 Watt.	.09
63-600	R3	2.2 Megohm	1/4 Watt.	.09
63-602	R1	4.7 Megohm	1/4 Watt.	.09
63-604	R16	10 Megohm	1/4 Watt.	.09
63-605	R21	1000 Ohm	1/2 Watt.	.10
63-635	R7	3300 Ohm	1/4 Watt.	.09
63-640	R8	8200 Ohm	1/4 Watt.	.09
63-654	R4	180,000 Ohm	1/4 Watt.	.09
63-976	R17	15 Megohm	1/4 Watt.	.09
63-1097	R19	870 Ohm. W.W. Insul.	1 Watt.	.24
63-1244	R9	Volume Control		1.20
63-1259	R13,14	Candohm (2 section)		.43
63-1366	R12	140 Ohm Zipohm W.W.	2-1/2 Watt	.24



MODELS 6G038

CHASSIS No. 6C50


ANT.
3.2 X AT 600 KC.
9.0 X AT 600 KC.
46 X FROM 600 KC. TO 455
BOTTOM VIEW OF TUBE SOCKETS
1LN5 R.F.
1LA6 CONVERTER
71V.
90V.
89V.
BL
WH-BL
47V.
L1
.8Ω
R3 10 MEG
R2 10000 ±10%
R1 4.7 MEG.
R4 180,000 ±10%
R5 47,000
R6 220
R7 2.2MEG.
R16 680 ±10%
C1
C2
C3
C4 .05
C5 0.1
C6 250M MF
C7
C8
C10
W1
W2
WH-GR
BR
RED
6.5Ω
8.5Ω
3.2Ω
L2 DET. COIL
L3 OSC. COIL
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED
I.F. FREQUENCY 455KC.
TUNING RANGE 535-1620 KC.
BATTERY PACK NO. Z909
DET. COIL
OSC. COIL
POSITION OF TERMINALS SWITCH S1
*NOTE: DOTTED LINES SHOW WIRING WH
SELENIUM RECTIFIER REPLACES
R8 BECOMES 140 OHMS ±10% WHE
SELENIUM RECTIFIER IS USED



MODELS 6G038

CHASSIS No. 6C50

MODEL 6G801
CHASSIS 6E40

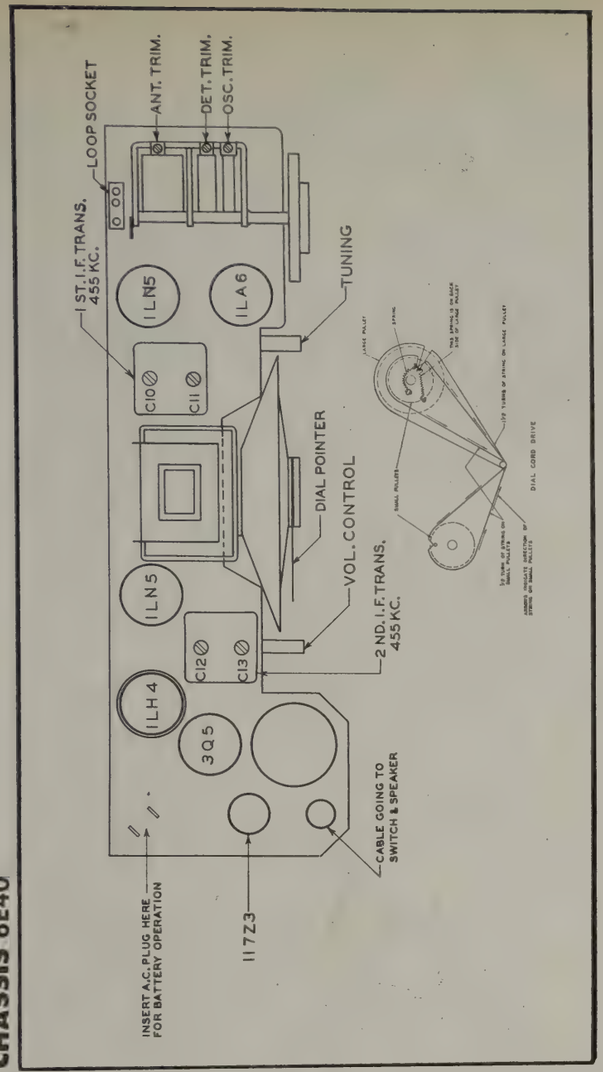
TO THE SERVICE MAN:

The 6E40 chassis is an AC, DC or battery operated superheterodyne circuit with a stage of RF amplification. The chassis is isolated from the DC circuit, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the terminal strip to which C5 is connected. The DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will appear. Microphonic tubes will cause audio howl. Check 1LA6.

The wavemagnet is connected to the chassis with a two wire cable. If the R.F. becomes weak or dead, check the D.C. resistance of the wavemagnet and connecting cable. This D.C. resistance should be approximately 1.75 ohms. If it is open check the cable and wavemagnet.

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the wavemagnet can be plugged in. All the connections and adjustments can be made from the top of the chassis. Connect a signal generator, through a .1 mfd. dummy antenna, to the lug on top of the center section of the gang condenser (converter grid) and condenser gang frame. Connect an output meter across the voice coil of the speaker (two lugs provided). Set the signal generator to 455 Kc. and adjust C10, C11, C12 and C13 for maximum indication on the output meter. Always keep the signal output from the generator just high enough to get an indication, otherwise excessive loading may result. Remove the signal generator leads from the gang.

RF Alignment: Connect a two turn loop across the leads of the signal generator, loosely couple this loop to the wavemagnet. Set the signal generator and the dial pointer of the receiver to 1600 Kc. and adjust oscillator trimmer to resonance. Set the signal generator and dial pointer to 1400 and adjust detector trimmer and antenna trimmer to resonance. These trimmers are on the top of gang condenser. Check operation and re-install set in cabinet. Tune in a weak station near 1400 Kc. or use background noise and readjust antenna trimmer for maximum sensitivity.



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

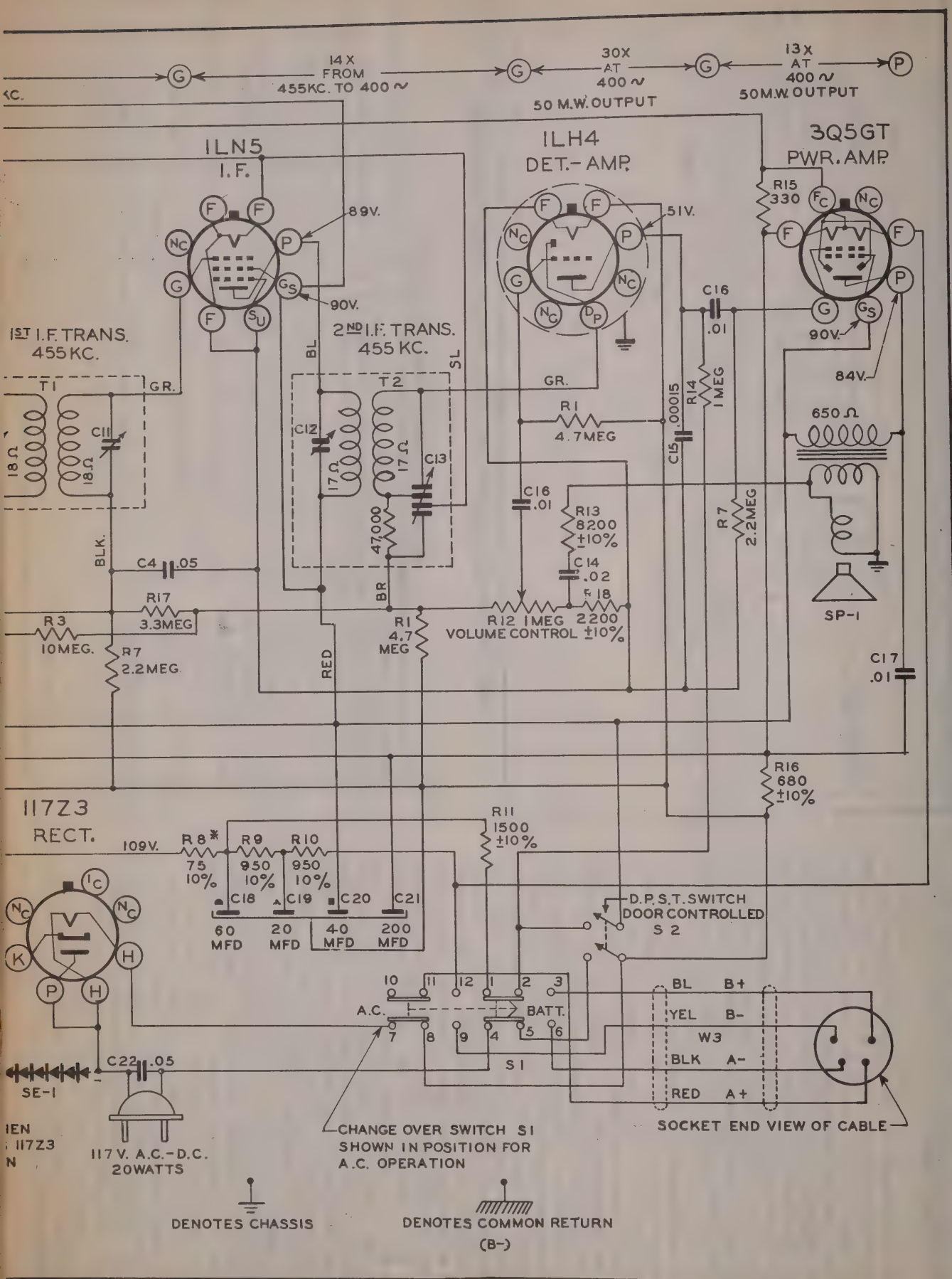
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL TO	TRIMMERS	PURPOSE
1	Converter Grid	.1 Mfd	455 Kc.	BC	600 Kc.	C-10-11-12-13	I.F. Alignment
2	Two turns loosely coupled to wavemagnet		1600 Kc.	BC	1600 Kc.	Osc. Trim.	Set Oscillator to scale
3	Two turns loosely coupled to wavemagent		1400 Kc.	BC	1400 Kc.	Det. Trim.	Align Det.
4	Two turns loosely coupled to wavemagnet		1400 Kc.	BC	1400 Kc.	Ant. Trim.	Align Wavemagnet

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-399		Louver dial	$ .65
54-262		Speed nut (4 used on 26-399)	.01
76-500		Tuning Control Shaft	.25
80-69		Dial Cord Tension Spring	.02
80-209		Dial Cord Tension Spring	.03
188-32		Retaining Ring (76-500)	1.03C
188-75		Retaining Ring (S-13829)	.02
S-13829		Dial Pointer & Pulley Assembly (59-201)	.30
S-13830		Condenser Pulley & Bushing Assembly	.45
S-13838		Pulley Mtg. Bracket & Stud Assembly	.20
S-14407		Dial Cord & Eyelet Assembly (Long)	.05
S-1440b		Dial Cord & Eyelet Assembly (Short)	.04
		COILS AND CHOKES	
95-1085	T1	1st I.F. Transformer	2.00
95-1086	T2	2nd I.F. Transformer	2.30
S-14385	L2	Detector Coil Assembly	.80
S-14389	L3	Oscillator Coil Assembly	.75
		CONDENSERS	
22-182	C6	.00025 MFD. (or 22-1666) 500 V.	.26
22-196	C16	.01 MFD 600 V.	.20
22-327	C14	.02 MFD 200 V.	.20
22-470	C15	150 MMFD. (or 22-1675) 500 V.	.20
22-827	C5	.1 MFD. 200 V.	.23
22-829	C4	.05 MFD 200 V.	.20
22-1017	C22	.05 MFD 400 V.	.20
22-1182	C17	.01 MFD 400 V.	.20
22-1726	C3,7,8	Single Section Trimmer (use with 22-1352)	.35
22-1727	C1	Three Gang Variable (or 22-1352)	4.15
22-1741	C18,19, 20,21	Four Section Electrolytic 20-40-60 MFD.-150V. x 200 MFD. *10V.	3.50
22-1763	C2	2.2 MMFD. Ceramic 500 V.	.20
		RESISTORS	
63-1362	R9,10	Two Section Candohm	.65
63-1562	R8	75 ohm W. W. (Insulated) .2 W.	.33
63-1642	R12	Volume Control	1.20
63-1758	R6	220 ohm (Insulated) ½ W.	.21
63-1765	R15	330 ohm (Insulated) ½ W.	.21
63-1778	R16	680 ohm (Insulated) ½ W.	.21
63-1792	R11	1500 ohm. (Insulated) ½ W.	.21
63-1799	R18	2200 ohm. (Insulated) ½ W.	.21
63-1824	R13	8200 ohm. (Insulated) ½ W.	.21
63-1827	R2	10 K ohm. (Insulated) ½ W.	.21
63-1856	R5	47 K ohm. (Insulated) ½ W.	.21
63-1880	R4	180 K ohm (Insulated) ½ W.	.21
63-1912	R14	1 Megohm. (Insulated) ½ W.	.21
63-1926	R7	2.2 Megohm. (Insulated) ½ W.	.21
63-1933	R17	3.3 Megohm. (Insulated) ½ W.	.21
63-1940	R1	4.7 Megohm. (Insulated) ½ W.	.21
63-1954	R3	10 Megohm (Insulated) ½ W.	.21
		MISCELLANEOUS	
11-104		Line Cord & Plug - 7 ft	.65
15-51		Plug Cap & Insulator	.09
17-103		Battery Cable Clamp	.02
24-458		Switch Cover	.15
28-23		Cabinet Door (R.H.)	.75
28-24		Cabinet Door (L.H.)	.75
40-74		Door Hinge (4 used)	.20
40-78		Cabinet Rear Cover Hinge (2 used on S-14412)	.04
43-159		Handle End Piece (2 used)	1.25
46-731		Door Release Knob	.25
46-732		Tuning & Volume Control Knob (2 used)	.15
49-631	SP-1	P.M. Speaker (5¼")	8.25
		206-631 Output Transformer	1.97
		208-631 Cone & Voice Coil	1.73
52-475	W1	Wavemagnet Cable	1.75
52-476	W2	Wavemagnet Extension Cable	1.50
54-30		#8-32 x 5/16" Hex. Nut - Steel - N.P	.31C
54-139		#3/8 - 32 x 9/16" Palnut - Cad.	.01
54-141		Tinnerman Speed Nut (used on 52-475)	1.20C
54-211		Tinnerman Speed Nut (8 used on S-14417)	.01
54-261		Spring Nut (used on 80-600)	.01
54-263		Speed Nut (used on 80-603)	.02
54-267		#6-32 x 5/16" Palnut Steel-N.P.	.45
56-236		Hinge Pin (4 used) (2 on 28-23) (2 on 28-24)	.01
57-1360		Chassis Front Plate	.15
57-1384		Chassis Civer Plate	.04
73-35		#8-32 x 3/16" Hex. Hd. Slotted Set Screw- Cup point	.03
78-274		Socket- Electrolytic Capacitor	.03
78-488		Socket - Loktal Tube	.25
78-543		Socket - Battery Cable (4 Contact)	.13

PART NO.	REF. NO.	DESCRIPTION	PRICE
		MISCELLANEOUS--Continued	
78-596		Socket - Loktal Tube (or 78-762) (8 Contact)	$ .18
78-781		Socket - Miniature Tube	.20
78-801		Socket - Octal Tube	.15
78-802		Socket - Wavemagnet Plug (3 Contact)	.10
80-597		Door Release Knob Spring	.02
80-598		Door Catch Spring	.02
80-599		Cover Catch Spring (2 used on S-14412)	.04
80-600		Door Hinge Retaining Spring (2 used on S-14417)	.05
80-601		Lock Lever Spring (Used on S-14424)	.04
80-602		Latch Bar Spring (used on S-14424)	$0.06
80-603		Wavemagnet Release Spring	.15
80-626		Pressure Spring (2 used on S-14424)	.02
80-629		Link Lever Spring	.03
83-1482		Rubber Strip (Handle)	.15
83-1487		Chassis Insulating Strip	.30
83-1510		Gang Condenser Shield Strip (used with 22-1352)	.02
83-1512		Rubber Strip (Handle)	.12
83-1524		Wavemagnet Cable Spacer Strip	.02
83-1525		Wavemagnet Cable Spacer Strip	.01
83-1531		Cushion Strip	.07
85-311	S1	Battery Change-Over Switch	.82
85-428	S2	D.P.S.T. Switch	.45
93-35		.032 x .144 x 3/8" Steel Washer - N.P	.25C
93-125		#6 Int. Shakeproof Lockwasher #1206	.31C
93-126		#8 Int. Shakeproof Lockwasher #1208	.36C
93-179		.031 x .140 x 5/16" Steel Washer - Cad. Pl.	.65C
93-282		Fibre Shoulder Washer	.01
93-321		Fibre Washer (used on 52-475)	.03
93-525		1/16" x .127 x 5/16" Fibre Washer	.65C
93-609		.015 x .134 x ¼" Steel Washer - N.P	.07C
93-721		Black Felt Washer (used on 80-603)	.01
93-906		Black Felt Washer (used on 80-603)	.02
93-911		Spring Washer (4 used)	.01
93-912		.010 x 9/64" x 5/16" Steel Washer N.P	.85C
93-913		.020 x .192 x 5/16" Steel Washer - Black Zinc Finish	.01
94-295		Condenser Mounting Bushing	.04
110-131		Grille Cloth	.25
112-713		#4-40 x ¼" Rd. Phillips Hd. M.S. (Lockwasher attached)	.02
112-714		#4 x ¼" Flat Hd. Self Tapping Screw (2 used)	.01
114-26		#8 x ¼" Hex. Hd. Self Tapping Screw (6 used)	.55C
114-48		#6-32 x ¼" Hex. Acorn Hd. M.S. - Steel - N.P	.43C
114-50		#8-32 x ¼" Hex. Acorn Hd. M.S. - Steel - N.P	.43C
114-248		#6-20 x 5/16" Hex. Hd. Slotted Self Tapping Screw (8 used)	.01
114-251		#10-32 x 5/8" Hex. Washer Hd. Slotted M. Screw (2 used)	.03
114-291		#8-32 x 7/16" Hex. Hd. Slotted M.S. - Steel - N.P	.85C
114-298		#6-32 x 3/8" Hex. Hd. Slotted M.S. (Lockwasher attached) (4 used)	.02
125-17		Rubber Grommet (3 used)	.03
125-26		Rubber Grommet (4 used)	.03
125-39		Rubber Grommet (2 used)	.02
126-572		Wavemagnet Shield (used on S-14563)	.08
126-573		Tube Shield	.04
139-72		Speaker Baffle	.75
159-49		Snap Button	.01
159-57		Snap Button (2 used on S-14563)	.02
197-18		Rubber Suction Cup (used on S-14563)	.08
197-22		Rubber Suction Cup (used on S-14563)	.10
199-83		Flexible Handle Sleeve	.45
202-589		Instruction Book	.20
212-3	SE-1	Selenium Rectifier	2.00
S-14412		Cabinet Frame Assembly	4.25
S-14414		Cabinet Door Latch, Release Knob & Spring Assembly	.45
S-14416		Switch Mounting Bracket & Lever Assembly	.30
S-14417		Cabinet Front Cover Assembly	5.75
S-14420		Cabinet Rear Cover & Rivet Assembly	3.25
S-14421		Handle Strap Assembly	.30
S-14422		Wavemagnet Assembly	2.65
S-14424		Cover Strip & Latch Bar Assembly	1.40
S-14563		Wavemagnet Shield Assembly	.35

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

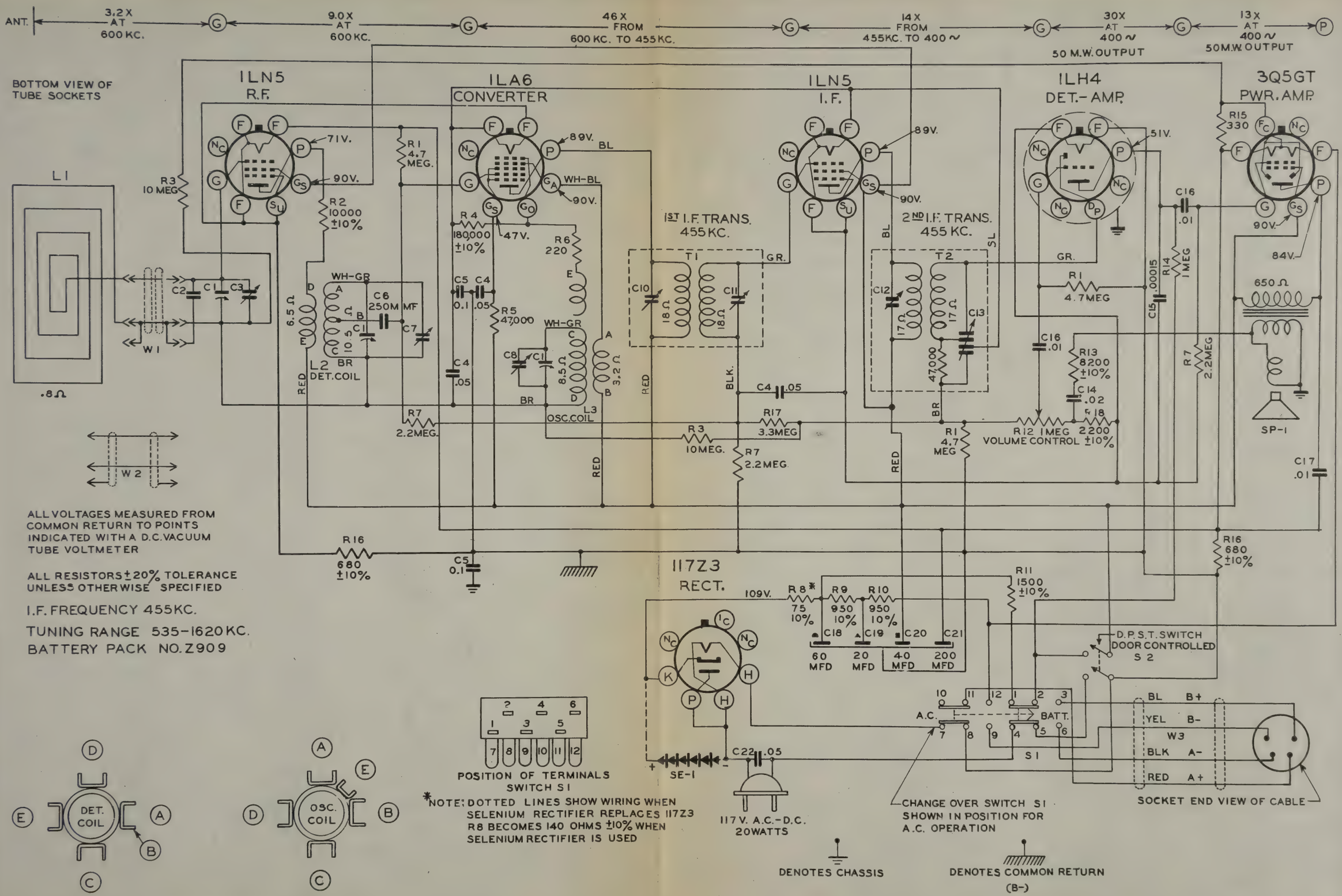


MODEL 6G801
CHASSIS 6E40

MISCELLANEOUS

2-135		Cabinet Back	.30
2-136		Cabinet Back (6R880GO only)	.35
11-104		Line Cord Plug - 7 ft.	.65
12-1468		Tone Control Mounting Bracket	.15
12-1486		Shield Support Bracket	.02
19-123		Record Changer Mounting Clip (4 used)	.10
46-687		Tuning & Volume Control Knob	.10
46-688		Tone Control Knob	.12
46-689		Phono Switch Knob	.10
49-602	SP-1	P. M. Speaker (5 1/4")	4.75
		208-602 Cone & Voice Coil	1.73
54-30		#8-32 X 5/16" Hex Nut Steel N.P. (2 used)	.31C
54-139		#3/8 - 32 X 9/16" Palnut Type 9N -Steel Cad. (2 used)	.01
54-143		Speed Nut	.03
54-228		Speed Nut (Used on 26-387)	.75C
54-267		#6-32 X 5/16" Hex Palnut - Inverted Type (4 used)	.45C
57-1105		Wavemagnet Lead Spacer Strip	.02
57-1398		Dial Escutcheon	4.00
57-1402		Chassis Cover Plate	.75
70-117		#6 X 5/16" Phillips Rd. Hd. Wood Screw-Steel - Statuary Bronze (7 used)	.01
70-128		#5 X 3/8" Washer Hd. Wood Screw-Steel-Statuary Bronze (6 used) (Cabinet Back Mtg.)	.01
72-74		#4 X 3/8" Phillips Flat Hd Wood Screw-Steel Brass Plate (Escutcheon Mtg.)	.02
78-274		Socket - Electrolytic Capacitor	.03
78-436		Socket - Miniature Tube	.19
78-792	P-1	Socket - Phono (5 contact)	.15
78-793		Socket - Octal Tube (2 used)	.15
78-794		Socket Miniature Tube (7 contact)	.20
78-795		Socket - Miniature Tube (7 contact) (2 used)	.20
80-407		Record Changer Mounting Spring (4 used)	.02
84-70		Tone Arm Support	.10
85-421	S-1	Phono - Radio Switch (or 85-438)	.90
85-422	S-2	Reject Switch	.40
93-125		#6 Int. Shakeproof Lockwasher (4 used)	.31C
93-126		#8 Int. Shakeproof Lockwasher (2 used)	.36C
93-721		Felt Washer (2 used)	.01
94-295		Capacitor Mounting Bushing (5 used)	.04
95-1025	T-3	Output Transformer	1.65
110-129		Grille Cloth	.25
112-544		Record Changer Mounting Screw (4 used)	.11
112-721		#6 X 7/16" Straight Binding Hd. Wood Screw Steel Statuary Bronze (8 used)	.85C
114-58		#6-32 X 3/8" Hex Acorn Hd. M.S. Steel N.P. (2 used)	.43C
114-67		#6-32 x 7/16" Hex Acorn Hd. M. S. Steel N.P. (3 used)	.43C
114-128		#10 X 1 1/16" Hex Washer Hd. Self Tapping Screw	1.81C
114-217		#8 X 1/4" Hex Hd. Slotted Self Tapping Screw-Cad (9 used)	.75C
114-291		#8-32 X 7/16" Hex Hd. Slotted M. Screw - Steel N.P.	.85C
125-17		Rubber Grommet (5 used)	.03
125-66		Rubber Grommet (2 used)	.05
139-71		Speaker Baffle	.40
166-44		Rubber Bumper (or 166-41)	.02
202-662		Instruction Book (Phono & Chassis)	.10
S-14958	L-1	Wavemagnet Assembly - Type 26 FR	1.25
S-14007		Non-Intermixer Record Changer	
S-14657		Hinge Assembly	1.85

PRICES SUBJECT TO CHANGE WITHOUT NOTICE
Z.R.C. 9/8/48



ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER

ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED

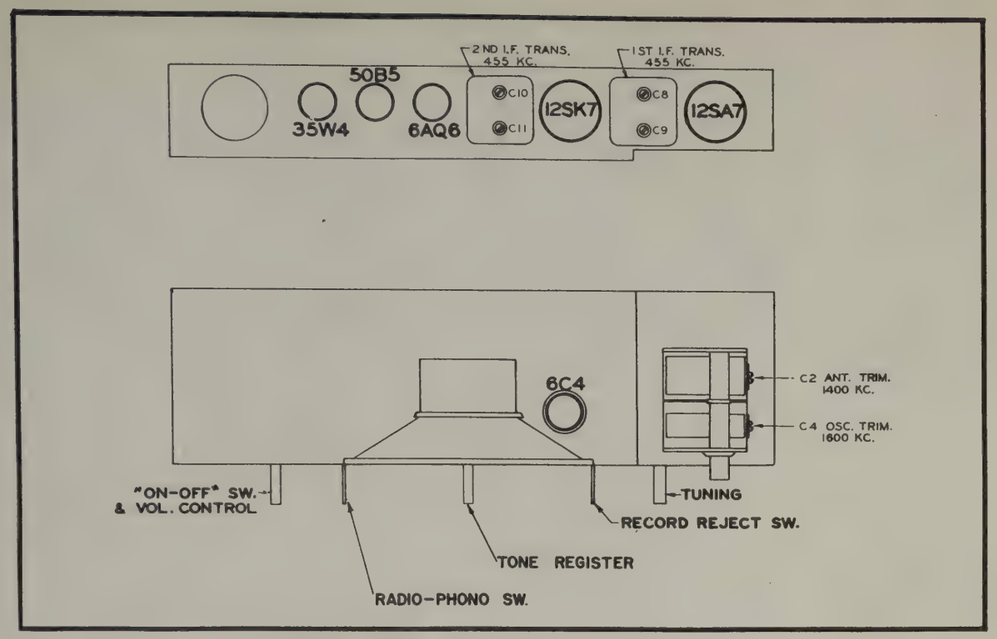
I.F. FREQUENCY 455KC.

TUNING RANGE 535–1620 KC.

BATTERY PACK NO. Z909

*NOTE: DOTTED LINES SHOW WIRING WHEN SELENIUM RECTIFIER REPLACES 117Z3 R8 BECOMES 140 OHMS ±10% WHEN SELENIUM RECTIFIER IS USED

MODEL 6G801
CHASSIS 6E40



TUBE AND TRIMMER LOCATION

TO THE SERVICEMAN:

The alignment of chassis 6E03 is conventional, however the adjustments interlock to some degree, therefore, the procedure must be followed exactly. Since this chassis is of the AC/DC type, care must be exercised when making measurements. Chassis 6E03 has a phono-radio push button switch of the double acting type. When in the "In" position this connects the radio for playing records. Socket P1 is used to connect the changer to the receiver chassis.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 MFD	455 Kc.	600 Kc.	C8, C9, C10, C11	Align I.F.
2	Single Turn Loop Loosely Coupled to Wavemagnet	-------	1600 Kc.	1600 Kc.	C4	Set Oscillator to Dial Scale.
3		-------	1400 Kc.	1400 Kc.	C2	Align Antenna.

PARTS LIST

DIAL ASSEMBLY

12-1383		Dial Light Bracket (2 used)	.02
26-387		Dial Scale	.70
76-492		Tuning Control Shaft	.15
78-769		Dual Dial Light Socket & Wire	.60
80-69		Dial Cord Tension Spring	.02
80-209		Dial Cord Tension Spring	.03
97-284		Dial Cord Guide Stud	.17
100-90	PL-1	Dial Light Bulb (2 used)	.11
188-32		Retaining Ring	1.03C
188-34		Retaining Ring	1.20C
S-13827		Dial Cord Assembly (Short)	.04
S-13828		Dial Cord Assembly (Long)	.05
S-13830		Tuning Pulley & Bushing Assembly	.45
S-14667		Dial Pointer & Pulley Assembly (59-214)	.30

COIL & CHOKES

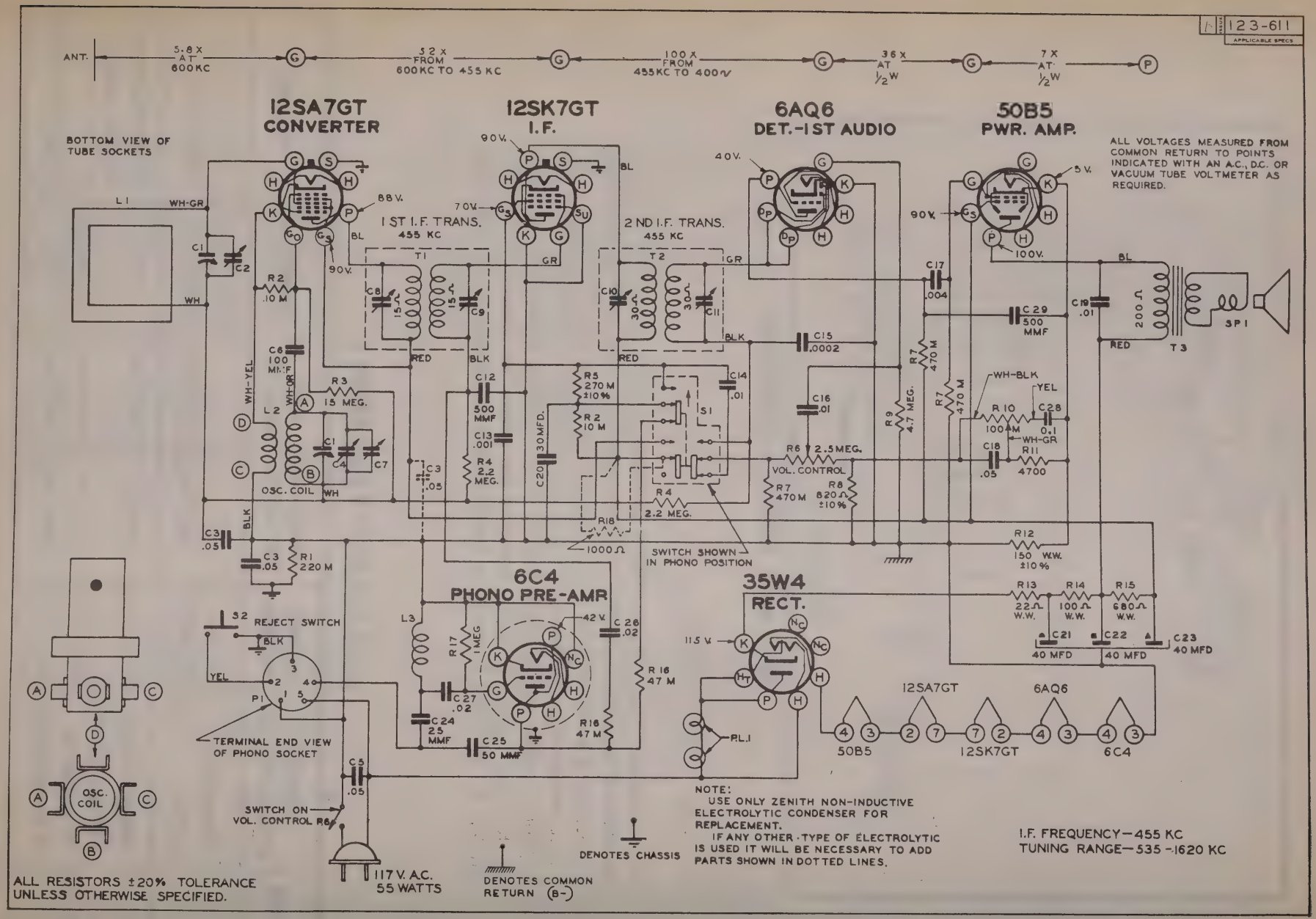
95-906	T-2	2nd I. F. Transformer	1.75
95-919	T-1	1st I. F. Transformer	1.80
S-12603	L-3	Phono Oscillator Coil Assembly (FM-Phono)	.75
S-13799	L-2	Oscillator Coil Assembly	.75

CONDENSERS

22-162	C-6	.0001 MFD (or 22-1669)	500 V.	.20
22-178	C-18	.05 MFD	200 V.	.20
22-188	C-26	.02 MFD	400 V.	.20
22-196	C-16	.01 MFD	600 V.	.20
22-243	C-14	.01 MFD	400 V.	.20
22-327	C-27	.02 MFD	200 V.	.20
22-448	C-17	.004 MFD	600 V.	.20
22-716	C-29	.0005 MFD	500 V.	.26
22-827	C-28	.1 MFD	200 V.	.23
22-829	C-3	.05 MFD	200 V.	.20
22-854	C-12	.0005 MFD	600 V.	.20
22-953	C-15	.0002 MFD (or 22-1668)	500 V.	.18
22-1017	C-5	.05 MFD	400 V.	.20
22-1182	C-19	.01 MFD	400 V.	.20
22-1444	C-13	.001 MFD	200 V.	.20
22-1532	C-25	50 MMFD (or 22-1674)	500 V.	.20
22-1657	C-1	Two Gang Variable		3.00
22-1707	C20,21,22,23	Dry Electrolytic 40-40-40-30 MFD	150 V.	3.00
22-1758	C-24	25 MMFD Ceramic	500 V.	.20

RESISTORS

63-686	R-12	150 ohm W. W.		½ W.	.21
63-1219	R-13	22 ohm W. W.		½ W.	.21
63-1220	R-14	100 ohm W. W.		1 W.	.24
63-1221	R-15	680 ohm W. W.		1 W.	.24
63-1555	R-6	Volume Control & Switch			1.81
63-1653	R-10	Tone Control			1.20
63-1782	R-8	820 ohm	(Insulated)	½ W.	.21
63-1814	R-11	4700 ohm	(Insulated)	½ W.	.21
63-1828	R-2	10 M ohm	(Insulated)	½ W.	.21
63-1856	R-16	47 M ohm	(Insulated)	½ W.	.21
63-1884	R-1	220 M ohm	(Insulated)	½ W.	.21
63-1887	R-5	270 M ohm	(Insulated)	½ W.	.21
63-1898	R-7	470 M ohm	(Insulated)	½ W.	.21
63-1911	R-17	1 Megohm	(Insulated)	½ W.	.21
63-1926	R-4	2.2 Megohm	(Insulated)	½ W.	.21
63-1940	R-9	4.7 Megohm	(Insulated)	½ W.	.21
63-1961	R-3	15 Megohm	(Insulated)	½ W.	.21

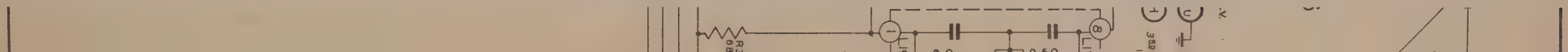

123-611
APPLICABLE SPECS
ANT.
5.8 X AT 600KC
5.2 X FROM 600KC TO 455 KC
100 X FROM 455KC TO 400∿
36 X AT ½W
7 X AT ½W
12SA7GT CONVERTER
12SK7GT I.F.
6AQ6 DET.-1ST AUDIO
50B5 PWR. AMP.
BOTTOM VIEW OF TUBE SOCKETS
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
1 ST I.F. TRANS. 455 KC
2 ND I.F. TRANS. 455 KC
OSC. COIL
VOL. CONTROL
SWITCH SHOWN IN PHONO POSITION
6C4 PHONO PRE-AMP
35W4 RECT.
32 REJECT SWITCH
TERMINAL END VIEW OF PHONO SOCKET
SWITCH ON VOL. CONTROL R6
117 V. A.C. 55 WATTS
DENOTES COMMON RETURN (B-)
DENOTES CHASSIS
NOTE:
USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT.
IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.
I.F. FREQUENCY—455 KC
TUNING RANGE—535 -1620 KC
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
50B5
12SK7GT
6C4
12SA7GT
6AQ6

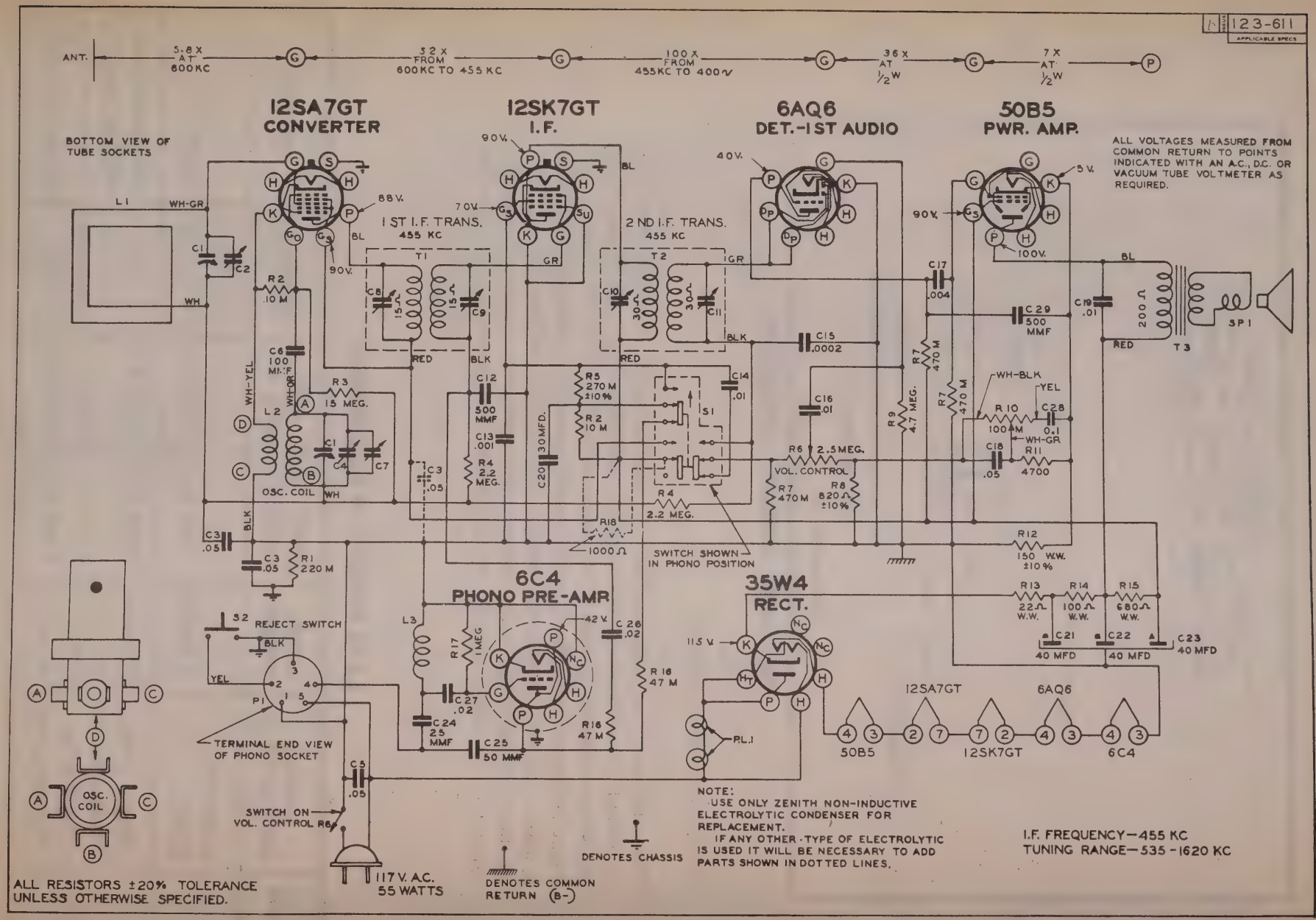
MODELS 6R880 CHASSIS 6E03

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION
		DIAL ASSEMBLY
12-1407		Dial Light Socket Mounting Bracket.
26-389		Louvre Dial
46-538		Tuning Control Knob
46-688		Tone Control Knob
46-718		Band Switch Knob.
54-211		Speed Nut (Dial Scale Mtg.)
57-1335		Tone Knob Escutcheon.
76-493		Tuning Shaft.
78-786		Dial Light Socket
80-69		Dial Cord Spring.
80-209		Dial Cord Spring.
80-444		Tuner Arm Tension Spring.
80-580		Tuner Arm Stop Spring
80-581		Tuner Arm Pressure Spring
83-1504		Dial Light Shield
93-475		Felt Washer
94-371		Pointer Pulley Bushing (S13944)
97-284		Dial Cord Guide Stud.
100-97		Dial Light Bulb - 115 V. - 10 W.
188-30		Retaining Ring (76-493)
188-102		Clamping Ring (46-538).
S-13944		Pointer Pulley and Bushing Assembly (59-205).
S-13945		Cam, Pulley and Bushing Assembly.
S-13981		Tone Control Mtg. Bracket and Lug Assem. (12-1404).
S-13982		Dial Cord and Eyelet Assembly (Short)
S-13983		Dial Cord and Eyelet Assembly (Long).
S-14129		Volume Control Knob Assembly (46-522-697)
S-14429		Tuner Arm Assembly.
		COILS AND CHOKES
S-11157	L5	Broadcast Oscillator Coil Assembly.
S-12256	L7	A.C. Line Choke Coil Assembly
S-12259	L6	F.M. Oscillator Coil Assembly
S-13871	L3	F.M. Detector Coil Assembly
S-13970	T1	1st I.F. Transformer Assembly
S-13971	T2	2nd I.F. Transformer Assembly
S-13972	T3	3rd I.F. Transformer Assembly
S-13973	T4	Discriminator Transformer Assembly.
S-13974	L4	Broadcast Detector Coil Assembly.
S-13997	L8	Filament Choke Coil Assembly.
S-14126	L23	R.F. Choke Coil Assembly.
S-14192	L2	F.M. Antenna Coil Assembly.

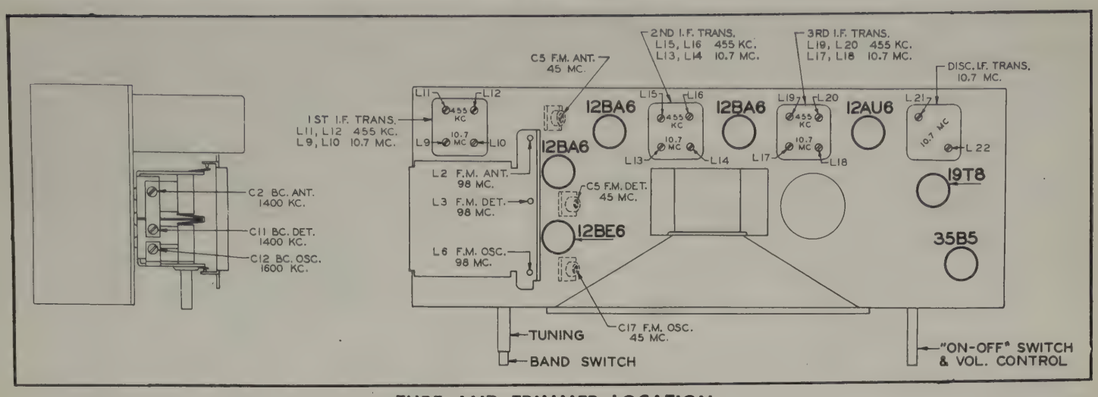
PART NO.	REF. NO.	DESCRIPTION
		CONDENSERS
22-162	C31	100 Mmfd. (or 22-1669) .500 V.
22-365	C20	100 Mmfd. (or 22-1701) .500 V.
22-829	C10	.05 Mfd. .200 V.
22-830	C22	.02 Mfd. .600 V.
22-1017	C30	.05 Mfd. .400 V.
22-1138	C23	500 Mmfd. (or 22-1703) .500 V.
22-1220	C15	.002 Mfd .600 V.
22-1367	C14	50 Mmfd. .500 V.
22-1385	C19	.01 Mfd. .200 V.
22-1418	C25	.1 Mfd .200 V.
22-1506	C6	22 Mmfd. (Ceramic) .500 V.
22-1507	C18	25 Mmfd. (Ceramic) .500 V.
22-1661	C26, C27, C28, C29	Dry Electrolytic 80-40-40 Mfd. 150 V. X 40 Mfd. - 25 V
22-1669	C9	100 Mmfd. (Ceramic). .500 V.
22-1676	C4	.001 Mfd. (Ceramic). .500 V.
22-1677	C1	Three Gang Variable.
22-1683	C21	.02 Mfd. (Shielded). .400 V.
22-1685	C5	Single Section Trimmer
22-1686	C17	Single Section Trimmer
22-1688	C8	19 Mmfd. (Ceramic) .500 V.
22-1689	C13	48 Mmfd. (Ceramic) .500 V.
22-1691	C16	55 Mmfd. (Silver on Ceramic)
22-1702	C24	.005 Mfd .400 V.
22-1705	C2	30 Mmfd. (Ceramic) .500 V.
22-1706	C7	.005 Mfd. (Ceramic) (Disc Type). .450 V.
		RESISTORS
63-1202	R22	330 Ohm (Wirewound). .2 W.
63-1450	R21	22 Ohm (Wirewound) .1 W.
63-1452	R23	270 Ohm (Wirewound). .2 W.
63-1582	R26	50M Ohm Tone Control
63-1584	R20	Volume Control and Switch.
63-1737	R1	68 Ohm (Insulated) .1/2 W.
63-1747	R27	120 Ohm (Insulated). .1/2 W.
63-1772	R2	470 Ohm (Insulated). .1/2 W.
63-1779	R3	680 Ohm (Insulated). .1/2 W.
63-1765	R19	1M Ohm (Insulated) .1/2 W.
63-1786	R7	1000 Ohm (Insulated) .1/2 W.
63-1799	R25	2200 Ohm (Insulated) .1/2 W.
63-1806	R14	3300 Ohm (Insulated) .1/2 W.
63-1810	R15	3900 Ohm (Insulated) .1/2 W.




123-611
APPLICABLE SPECS
ANT.
5.8 X AT 600 KC
32 X FROM 600 KC TO 455 KC
100 X FROM 455 KC TO 400 V
36 X AT ½ W
7 X AT ½ W
P
12SA7GT CONVERTER
12SK7GT I.F.
6AQ6 DET.-1ST AUDIO
50B5 PWR. AMP.
BOTTOM VIEW OF TUBE SOCKETS
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
1 ST I.F. TRANS. 455 KC
2 ND I.F. TRANS. 455 KC
T1
T2
T3
L1
L2
L3
OSC. COIL
R1 220 M
R2 10 M
R3 15 MEG.
R4 2.2 MEG.
R5 270 M ±10%
R6 2.5 MEG. VOL. CONTROL
R7 470 M
R8 820 Ω ±10%
R9 4.7 MEG.
R10 100 M
R11 4700
R12 150 W.W. ±10%
R13 22 Ω W.W.
R14 100 Ω W.W.
R15 680 Ω W.W.
R16 47 M
R17 1 MEG
R18 1000 Ω
C1 C2 C3 .05 C4 C5 .05 C6 100 MMF C7 C8 15 C9 15 C10 30 C11 30
C12 500 MMF C13 .001 C14 .01 C15 .0002 C16 .01 C17 .004 C18 .05 C19 .01
C20 30 MFD. C21 40 MFD C22 40 MFD C23 40 MFD C24 25 MMF C25 50 MMF C26 .02 C27 .02 C28 0.1 C29 500 MMF
S1 S2 REJECT SWITCH
SWITCH SHOWN IN PHONO POSITION
6C4 PHONO PRE-AMP
35W4 RECT.
SP1
PL.1
TERMINAL END VIEW OF PHONO SOCKET
SWITCH ON VOL. CONTROL R6
117 V. A.C. 55 WATTS
DENOTES CHASSIS
DENOTES COMMON RETURN (B-)
NOTE: USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT. IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.
I.F. FREQUENCY—455 KC
TUNING RANGE—535 - 1620 KC
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
12SA7GT 6AQ6 50B5 12SK7GT 6C4

MODELS 6R880 CHASSIS 6E03

MODEL 7H820
CHASSIS 7E01



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7E01 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

When adjustments are made on the 7E01 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

The tone control is of the low impedance type in which a portion of the audio voltage is taken from the voice coil and fed back into the grid of the first audio. The voltage is fed back out of phase. R25, 26 and C25 determine the characteristic of the feed back voltage. A much greater varation of tone can be had by this system.

The filter circuits of chassis 7E01 incorporate new features. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter capacitor C26 off the selenium nectifier to the 35B5 plate. The lower connection of the output transformer feeds B + to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 35B5 produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reductoon of hum is accomplished by filtering through resistors R22 and R23 capacitors C27 and C28.

This development in filtering systems allows a higher effective plate voltage on the 35B5 for increased power output.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1035 be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L-11, 12, 15, 16, 19 and 20	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C12	Set oscillator to dial scale.
3	2 turns loosely cpld. cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C11 and C2	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L21 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L22 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L17 and L18 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L13 and L14 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L9 and L10 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
9 (c)(d)	Antenna Post F (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L6 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c)(d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 and L2 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.
11 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C17	Set oscillator to dial scale.
12 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C5 Det., C5 Ant.	Align detector and ant. stages for maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).

(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

DIAL ASSEMBLY

PART NO.	REF. NO.	DESCRIPTION
12-1407		Dial Light Socket Mounting Bracket.
26-389		Louvre Dial
46-538		Tuning Control Knob
46-688		Tone Control Knob
46-718		Band Switch Knob.
54-211		Speed Nut (Dial Scale Mtg.)
57-1335		Tone Knob Escutcheon.
76-493		Tuning Shaft.
78-786		Dial Light Socket
80-69		Dial Cord Spring.
80-209		Dial Cord Spring.
80-444		Tuner Arm Tension Spring.
80-580		Tuner Arm Stop Spring
80-581		Tuner Arm Pressure Spring
83-1504		Dial Light Shield
93-475		Felt Washer
94-371		Pointer Pulley Bushing (SL3944)
97-284		Dial Cord Guide Stud.
100-97		Dial Light Bulb - 115 V. - 10 W.
188-30		Retaining Ring (76-493)
188-102		Clamping Ring (46-538).
S-13944		Pointer Pulley and Bushing Assembly (59-205).
S-13945		Cam, Pulley and Bushing Assembly.
S-13981		Tone Control Mtg. Bracket and Lug Assem. (12-1404).
S-13982		Dial Cord and Eyelet Assembly (Short)
S-13983		Dial Cord and Eyelet Assembly (Long).
S-14129		Volume Control Knob Assembly (46-522-697)
S-14429		Tuner Arm Assembly.

COILS AND CHOKES

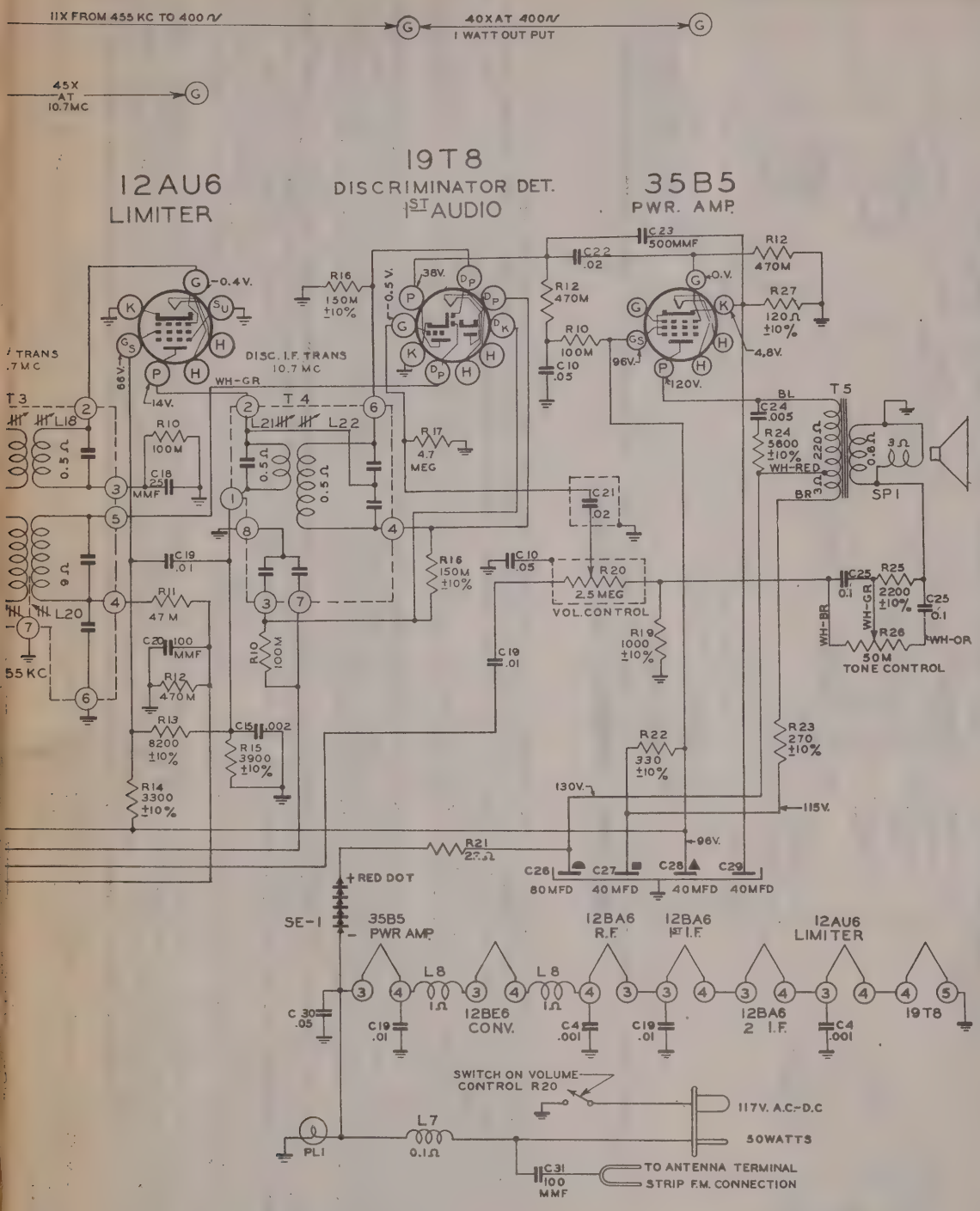
S-11157	L5	Broadcast Oscillator Coil Assembly.
S-12256	L7	A.C. Line Choke Coil Assembly
S-12259	L6	F.M. Oscillator Coil Assembly
S-13871	L3	F.M. Detector Coil Assembly
S-13970	T1	1st I.F. Transformer Assembly
S-13971	T2	2nd I.F. Transformer Assembly
S-13972	T3	3rd I.F. Transformer Assembly
S-13973	T4	Discriminator Transformer Assembly.
S-13974	L4	Broadcast Detector Coil Assembly.
S-13997	L8	Filament Choke Coil Assembly.
S-14126	L23	R.F. Choke Coil Assembly.
S-14192	L2	F.M. Antenna Coil Assembly.

CONDENSERS

PART NO.	REF. NO.	DESCRIPTION
22-162	C31	100 Mmfd. (or 22-1669) .500 V.
22-365	C20	100 Mmfd. (or 22-1701) .500 V.
22-829	C10	.05 Mfd. .200 V.
22-830	C22	.02 Mfd. .600 V.
22-1017	C30	.05 Mfd. .400 V.
22-1138	C23	500 Mmfd. (or 22-1703) .500 V.
22-1220	C15	.002 Mfd .600 V.
22-1367	C14	50 Mmfd. .500 V.
22-1385	C19	.01 Mfd. .200 V.
22-1418	C25	.1 Mfd .200 V.
22-1506	C6	22 Mmfd. (Ceramic) .500 V.
22-1507	C18	25 Mmfd. (Ceramic) .500 V.
22-1661	C26, C27, C28, C29	Dry Electrolytic 80-40-40 Mfd. 150 V. X 40 Mfd. - 25 V
22-1669	C9	100 Mmfd. (Ceramic). .500 V.
22-1676	C4	.001 Mfd. (Ceramic). .500 V.
22-1677	C1	Three Gang Variable.
22-1683	C21	.02 Mfd. (Shielded). .400 V.
22-1685	C5	Single Section Trimmer
22-1686	C17	Single Section Trimmer
22-1688	C8	19 Mmfd. (Ceramic) .500 V.
22-1689	C13	48 Mmfd. (Ceramic) .500 V.
22-1691	C16	55 Mmfd. (Silver on Ceramic)
22-1702	C24	.005 Mfd .400 V.
22-1705	C2	30 Mmfd. (Ceramic) .500 V.
22-1706	C7	.005 Mfd. (Ceramic) (Disc Type). .450 V.

RESISTORS

63-1202	R22	330 Ohm (Wirewound). .2 W.
63-1450	R21	22 Ohm (Wirewound) .1 W.
63-1452	R23	270 Ohm (Wirewound). .2 W.
63-1582	R26	50M Ohm Tone Control
63-1584	R20	Volume Control and Switch.
63-1737	R1	68 Ohm (Insulated) .1/2 W.
63-1747	R27	120 Ohm (Insulated). .1/2 W.
63-1772	R2	470 Ohm (Insulated) .1/2 W.
63-1779	R3	680 Ohm (Insulated). .1/2 W.
63-1765	R19	1M Ohm (Insulated) .1/2 W.
63-1786	R7	1000 Ohm (Insulated) .1/2 W.
63-1799	R25	2200 Ohm (Insulated) .1/2 W.
63-1806	R14	3300 Ohm (Insulated) .1/2 W.
63-1810	R15	3900 Ohm (Insulated) .1/2 W.



ALL VOLTAGE MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED

ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED

AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7 M.C.

TUNING RANGES
540-1620 K.C. STD. B.C.
88-108 M.C. F.M. 100
42-48.5 M.C. F.M. 45

DENOTES CHASSIS

MODEL 7H820
CHASSIS 7E01

PARTS LIST

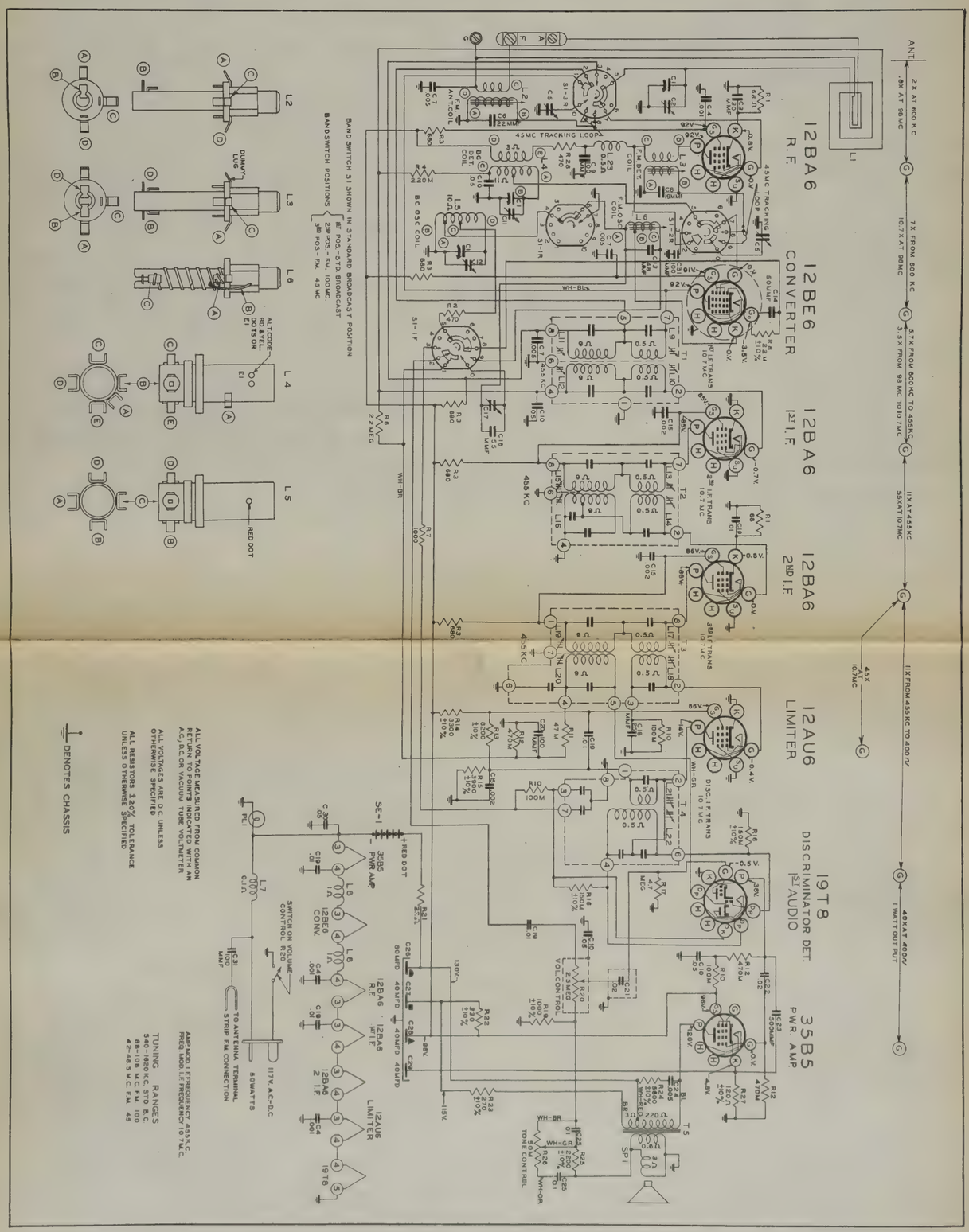
PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-403		Dial Scale	$0.85
46-734		Volume and Tuning Control Knob (2 used)	.10
46-735		Band Switch Knob	.20
54-268		Speed Nut (Cabinet Plate Mtg.)	.01
57-1378		Cabinet Emblem Plate	.70
59-146		Dial Pointer	.24
76-506		Tuning Control Shaft	.15
80-69		Dial Cord Tension Spring	.02
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-581		Tuner Arm Pressure Spring	.10
93-956		1/16" x 9/32 x 3/4" Black Felt Washer (59-146)	.01
94-295		Dial Spacer Bushing	.04
188-32		Retaining Ring	1.03C
S14523		Tuning Shaft Bracket and Insulating Strip Assembly	.20
S14524		Condenser Pulley and Cam Assembly	.55
S14525		Tuner Arm Assembly	.75
S14526		Dial Cord and Eyelet Assembly	.05
		COILS AND CHOKES	
S13871	L5	F. M. Detector Coil Assembly	.75
S13973	T4	Discriminator Transformer Assembly	2.00
S13997	L17	Filament Choke Assembly (2 Used)	.40
S14480	L2	F. M. Antenna Coil Assembly	.50
S14481	L5	Broadcast Oscillator Coil Assembly	.75
S14509	T3	3rd. I. F. Coil Assembly	2.50
S14521	T1	1st. I. F. Transformer Assembly	2.50
S14522	T2	2nd. I. F. Transformer Assembly	2.75
S14695	L3	F. M. Oscillator Coil Assembly	.60
		CONDENSERS	
22-162	C2	100 MMFD (Or 22-1669) .500.V.	.20
22-229	C16	.005 Mfd. .600 V.	.20
22-829	C9	.05 MFD .200 V.	.20
22-830	C13	.02 MFD. .690.V.	$0.20
22-854	C17	500 MMFD .600 V.	.20
22-1017	C14	.05 MFD. .400 V.	.20
22-1126	C15	.01 MFD. .400 V.	.20
22-1158	C18	.05 MFD. .200 V.	.20
22-1220	C10	.002 MFD .600 V.	.20
22-1367	C19	50 MMFD. (Ceramic) .500 V.	.33
22-1385	C1	.01 MFD. .200 V.	.20
22-1492	C7	50 MMFD. (Ceramic) .500 V.	.27
22-1507	C12	25 MMFD. (Ceramic) .500 V.	.33
22-1676	C3	.001 MFD. (Ceramic) .500 V.	.40
22-1688	C8	19 MMFD. (Ceramic) .500 V.	.30
22-1742	C4	Two Section Variable .500 V.	3.00
22-1757	C20, C21	Electrolytic 80-40 MFD.-150 V.	2.50
22-1768	C11	30 MMFD. (Ceramic) .500 V.	.20
		RESISTORS	
63-686	R18	150 Ohm W. W. (Insulated) .1/2 W.	.21
63-1223	R15	1 Ohm W. W. (Insulated) .1/2 W.	.21
63-1450	R19	22 Ohm W. W. (Insulated) .1 W.	.24
63-1527	R13	1000 Ohm W. W. (Insulated) .3 W.	.39
63-1646	R11	Volume Control and Switch	1.81
63-1737	R2	68 Ohm (Insulated) .1/2 W.	.21
63-1758	R4	220 Ohm (Insulated) .1/2 W.	.21
63-1779	R1	680 Ohm (Insulated) .1/2 W.	.21
63-1782	R12	820 Ohm (Insulated) .1/2 W.	.21
63-1800	R16	2200 Ohm (Insulated) .1/2 W.	.21
63-1835	R9	15M Ohm (Insulated) .1/2 W.	.21
63-1842	R3	22M Ohm (Insulated) .1/2 W.	.21
63-1856	R7	47M Ohm (Insulated) .1/2 W.	.21
63-1870	R8	100M Ohm (Insulated) .1/2 W.	.21
63-1876	R10	150M Ohm (Insulated) .1/2 W.	.21
63-1898	R17	470M Ohm (Insulated) .1/2 W.	.21
63-1912	R6	1 Megohm (Insulated) .1/2 W.	.21
63-1926	R5	2.2 Megohm (Insulated) .1/2 W.	.21
63-1940	R14	4.7 Megohm (Insulated) .1/2 W.	.21
		MISCELLANEOUS	
12-1070		Wavemagnet Mounting Bracket	.25
14-1022		Model 822-Plastic Cabinet	5.00

PARTS LIST--Continued

PART NO.	REF. NO.	DESCRIPTION
		RESISTORS--Continued
63-1871	R29	5600 Ohm (Insulated) . . . . . .1/2 W.
63-1824	R13	8200 Ohm (Insulated) . . . . . .1/2 W.
63-1841	R8	22M Ohm (Insulated) . . . . . .1/2 W.
63-1856	R11	47M Ohm (Insulated) . . . . . .1/2 W.
63-1870	R10	100M Ohm (Insulated) . . . . . .1/2 W.
63-1876	R16	150M Ohm (Insulated) . . . . . .1/2 W.
63-1884	R4	220M Ohm (Insulated) . . . . . .1/2 W.
63-1898	R12	470M Ohm (Insulated) . . . . . .1/2 W.
63-1926	R6	2.2 Megohm (Insulated) . . . . . .1/2 W.
63-1940	R17	4.7 Megohm (Insulated) . . . . . .1/2 W.
		MISCELLANEOUS
12-1070		Wavemagnet Mounting Bracket. . . . .
14-848		Model 820W - Plastic Cabinet (7H82DW). . . . .
14-1020		Model 820 - Bakelite Cabinet (7H820) . . . . .
19-139		Cabinet Back Retaining Clip (4 used) . . . . .
49-608		7½" P. M. Speaker 208-608 and Voice Coil . . . . .
54-30		#8-32 x 5/16" x 7/64" Hex Nut - Steel N.P. (6 used).
54-139		#3/8-32 x 9/16" Palnut - Type 9N-Steel-Cad. (2 used)
54-226		Speed Nut - Tinnerman #C518B-014-27 (3 used) . . . .
57-1269		I.F. Transformer Terminal Plate. . . . .
58-168		Two Prong Plug . . . . .
73-30		#6-32 x 1/4" Hex Hd. Set Screw - Cuppoint (2 used) .
78-782		Socket - Miniature Tube (7 Contact) (2 used) . . . .
78-788		Socket - Miniature Tube (9 Contact). . . . .
78-794		Socket - Miniature Tube (7 Contact) (3 used) . . . .
78-795		Socket - Miniature Tube (7 Contact). . . . .
83-1063		Threaded Insert (used on all I.F. Transformers). . .
83-1064		Threaded Insert (used on all I.F. and Discriminator Transformers). . . . .
83-1090		Insulating Strip (58-168). . . . .
83-1479		Insulating Strip . . . . .
83-1480		Insulating Strip . . . . .
83-1503		Tone Arm Insulating Strip. . . . .
85-417		Band Switch (use S-14168). . . . .
93-2		.016 x .134 x 1/4" Brass Washer. . . . .
93-94		Bakelite Shoulder Washer . . . . .

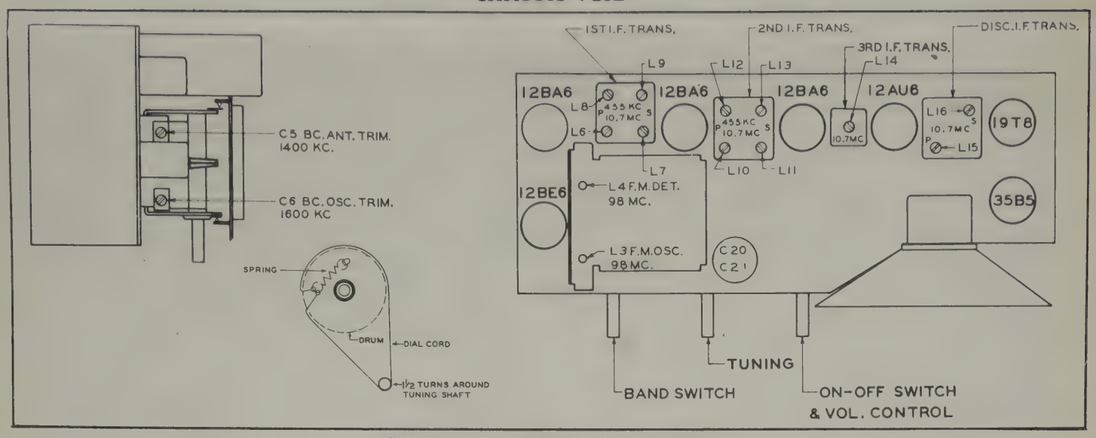
PART NO.	REF. NO.	DESCRIPTION
93-125		#6 Internal Shakeproof Lockwasher #1206. . . . .
93-126		#8 Internal Shakeproof Lockwasher #1208. . . . .
93-665		Fibre Washer . . . . .
93-735		.012 x .093 x 11/64" Steel Washer - Cadmium. . . . .
93-889		Insulating Washer. . . . .
94-334		Speaker Mtg. Bushing . . . . .
94-485		Fibre Bushing. . . . .
94-598		R.F. Plate Mtg. Bushing. . . . .
95-1035		Output Transformer . . . . .
97-293		Insulating Stud (Chassis Mtg. Stud) (4 used) . . . .
102-466		Dial Calibration Label . . . . .
110-130		Grille Cloth . . . . .
112-281		#10 x 3/4" Oval Binding Hd. Self Tapping Screw Type Z - Stat. Bronze . . . . .
114-26		#8 x 1/4" Hex Hd. Self Tapping Screw - Type Z - Cad.
114-48		#6-32 x 1/4" Hex Acorn Hd. M.S., Steel N.P. (9 used)
114-78		#8 x 5/16" Hex Hd. Slotted Self Tapping Screw (Wavemagnet Mtg.). . . . .
114-92		#6 x 1-1/8" Hex Hd. Slotted Self Tapping Screw Type Z - Cad. . . . .
114-157		#6 x 1/2" Hex Hd. Self Tapping Screw - Stan-Tap. Cad
114-218		#10 x 7/8" Slotted Washer Hd. Self Tapping Screw (Chassis Mtg.) . . . . .
114-291		#8-32 x 7/16" Hex Hd, Slotted M. Screw - Steel, N.P.
114-292		#6 x 5/8" Hex Hd. Slotted Self Tapping Screw Stan-Tap. - Cad.. . . . .
125-17		Rubber Grommet (4 used) (49-608) . . . . .
125-62		Rubber Grommet (Used on R.F. Plate) (4 used) . . . .
126-554		Miniature Tube Shield. . . . .
139-69		Speaker Baffle . . . . .
149-39		Iron Core (Used on all I.F. and Discriminator Transf.)
149-64		Tuning Core. . . . .
188-34		Retaining Ring . . . . .
202-506		F.M. Instruction Book. . . . .
202-553		Instruction Book . . . . .
212-3		Selenium Rectifier (or 212-4). . . . .
S-13977	L1	Wavemagnet Assembly - Type 29D . . . . .
S-14128		Cabinet Back, A.C. Plug and Cord Assembly (7H820). .
S-14168		Bandswitch and Terminal Strip Assembly . . . . .
S-14358		Wavemagnet Cable Assembly. . . . .
S-14562		Cabinet Back, A.C. Plug and Cord Assembly (7H820W) .

CPC--25M--1-1-48



MODEL 7H820
CHASSIS 7E01

MODEL 7H822
CHASSIS 7E02



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7E02 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all bands.

When adjustments are made on the 7E02 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z800I) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C6	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C5	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

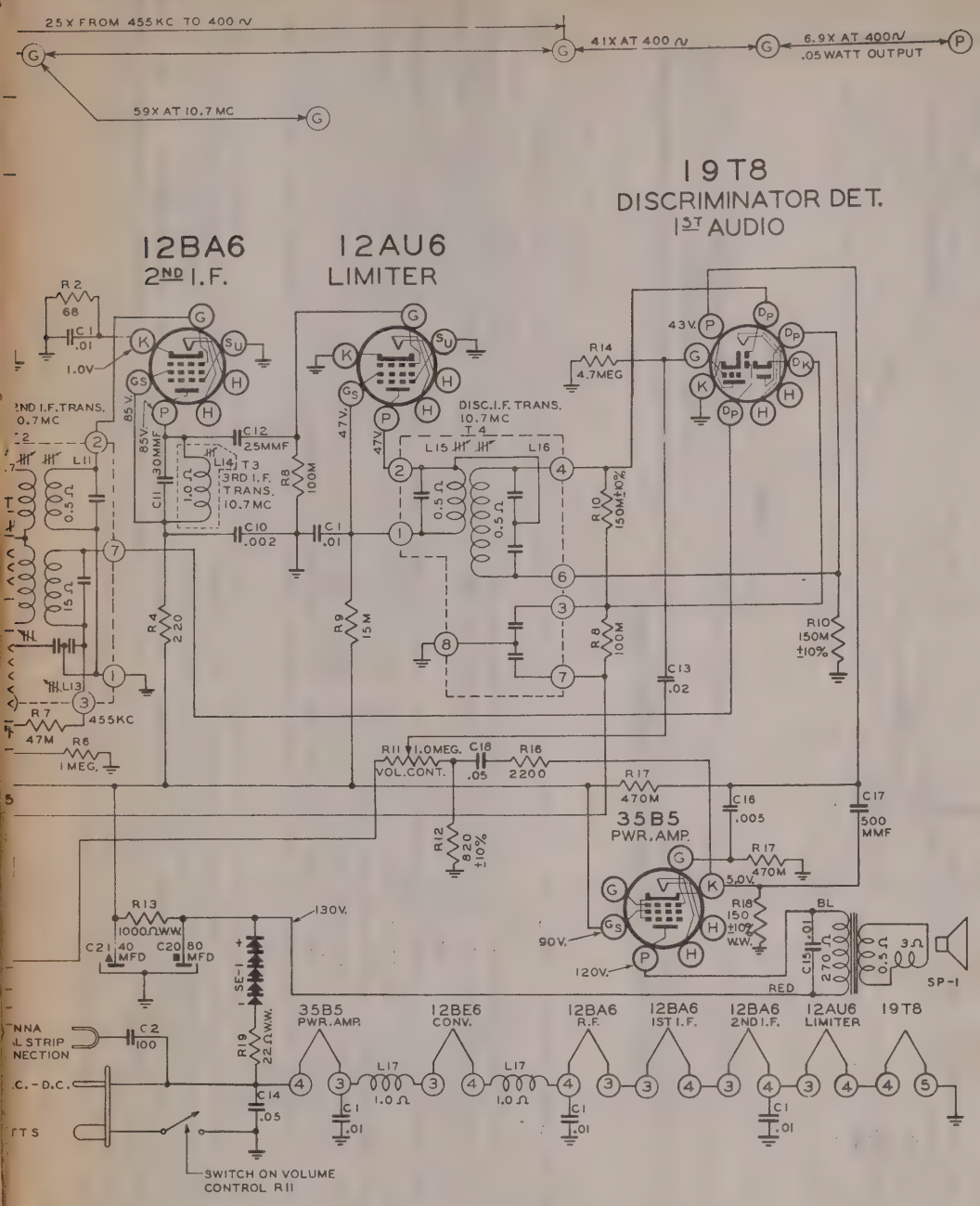
An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-403		Dial Scale	$0.85
46-734		Volume and Tuning Control Knob (2 used)	.10
46-735		Band Switch Knob	.20
54-268		Speed Nut (Cabinet Plate Mtg.)	.01
57-1378		Cabinet Emblem Plate	.70
59-146		Dial Pointer	.24
76-506		Tuning Control Shaft	.15
80-69		Dial Cord Tension Spring	.02
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-581		Tuner Arm Pressure Spring	.10
93-956		1/16" x 9/32 x 3/4" Black Felt Washer (59-146)	.01
94-295		Dial Spacer Bushing	.04
188-32		Retaining Ring	1.03C
S14523		Tuning Shaft Bracket and Insulating Strip Assembly	.20
S14524		Condenser Pulley and Cam Assembly	.55
S14525		Tuner Arm Assembly	.75
S14526		Dial Cord and Eyelet Assembly	.05
		COILS AND CHOKES	
S13871	L5	F. M. Detector Coil Assembly	.75
S13973	T4	Discriminator Transformer Assembly	2.00
S13997	L17	Filament Choke Assembly (2 Used)	.40
S14480	L2	F. M. Antenna Coil Assembly	.50
S14481	L5	Broadcast Oscillator Coil Assembly	.75
S14509	T3	3rd. I. F. Coil Assembly	2.50
S14521	T1	1st. I. F. Transformer Assembly	2.50
S14522	T2	2nd. I. F. Transformer Assembly	2.75
S14695	L3	F. M. Oscillator Coil Assembly	.60
		CONDENSERS	
22-162	C2	100 MMFD (Or 22-1669) .500.V.	.20
22-229	C16	.005 Mfd. .600 V.	.20
22-829	C9	.05 MFD .200 V.	.20
22-830	C13	.02 MFD. .690.V.	$0.20
22-854	C17	500 MMFD .600 V.	.20
22-1017	C14	.05 MFD. .400 V.	.20
22-1126	C15	.01 MFD. .400 V.	.20
22-1158	C18	.05 MFD. .200 V.	.20
22-1220	C10	.002 MFD .600 V.	.20
22-1367	C19	50 MMFD. (Ceramic) .500 V.	.33
22-1385	C1	.01 MFD. .200 V.	.20
22-1492	C7	50 MMFD. (Ceramic) .500 V.	.27
22-1507	C12	25 MMFD. (Ceramic) .500 V.	.33
22-1676	C3	.001 MFD. (Ceramic) .500 V.	.40
22-1688	C8	19 MMFD. (Ceramic) .500 V.	.30
22-1742	C4	Two Section Variable .500 V.	3.00
22-1757	C20, C21	Electrolytic 80-40 MFD.-150 V.	2.50
22-1768	C11	30 MMFD. (Ceramic) .500 V.	.20
		RESISTORS	
63-686	R18	150 Ohm W. W. (Insulated) .1/2 W.	.21
63-1223	R15	1 Ohm W. W. (Insulated) .1/2 W.	.21
63-1450	R19	22 Ohm W. W. (Insulated) .1 W.	.24
63-1527	R13	1000 Ohm W. W. (Insulated) .3 W.	.39
63-1646	R11	Volume Control and Switch	1.81
63-1737	R2	68 Ohm (Insulated) .1/2 W.	.21
63-1758	R4	220 Ohm (Insulated) .1/2 W.	.21
63-1779	R1	680 Ohm (Insulated) .1/2 W.	.21
63-1782	R12	820 Ohm (Insulated) .1/2 W.	.21
63-1800	R16	2200 Ohm (Insulated) .1/2 W.	.21
63-1835	R9	15M Ohm (Insulated) .1/2 W.	.21
63-1842	R3	22M Ohm (Insulated) .1/2 W.	.21
63-1856	R7	47M Ohm (Insulated) .1/2 W.	.21
63-1870	R8	100M Ohm (Insulated) .1/2 W.	.21
63-1876	R10	150M Ohm (Insulated) .1/2 W.	.21
63-1898	R17	470M Ohm (Insulated) .1/2 W.	.21
63-1912	R6	1 Megohm (Insulated) .1/2 W.	.21
63-1926	R5	2.2 Megohm (Insulated) .1/2 W.	.21
63-1940	R14	4.7 Megohm (Insulated) .1/2 W.	.21
		MISCELLANEOUS	
12-1070		Wavemagnet Mounting Bracket	.25
14-1022		Model 822-Plastic Cabinet	5.00



ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED

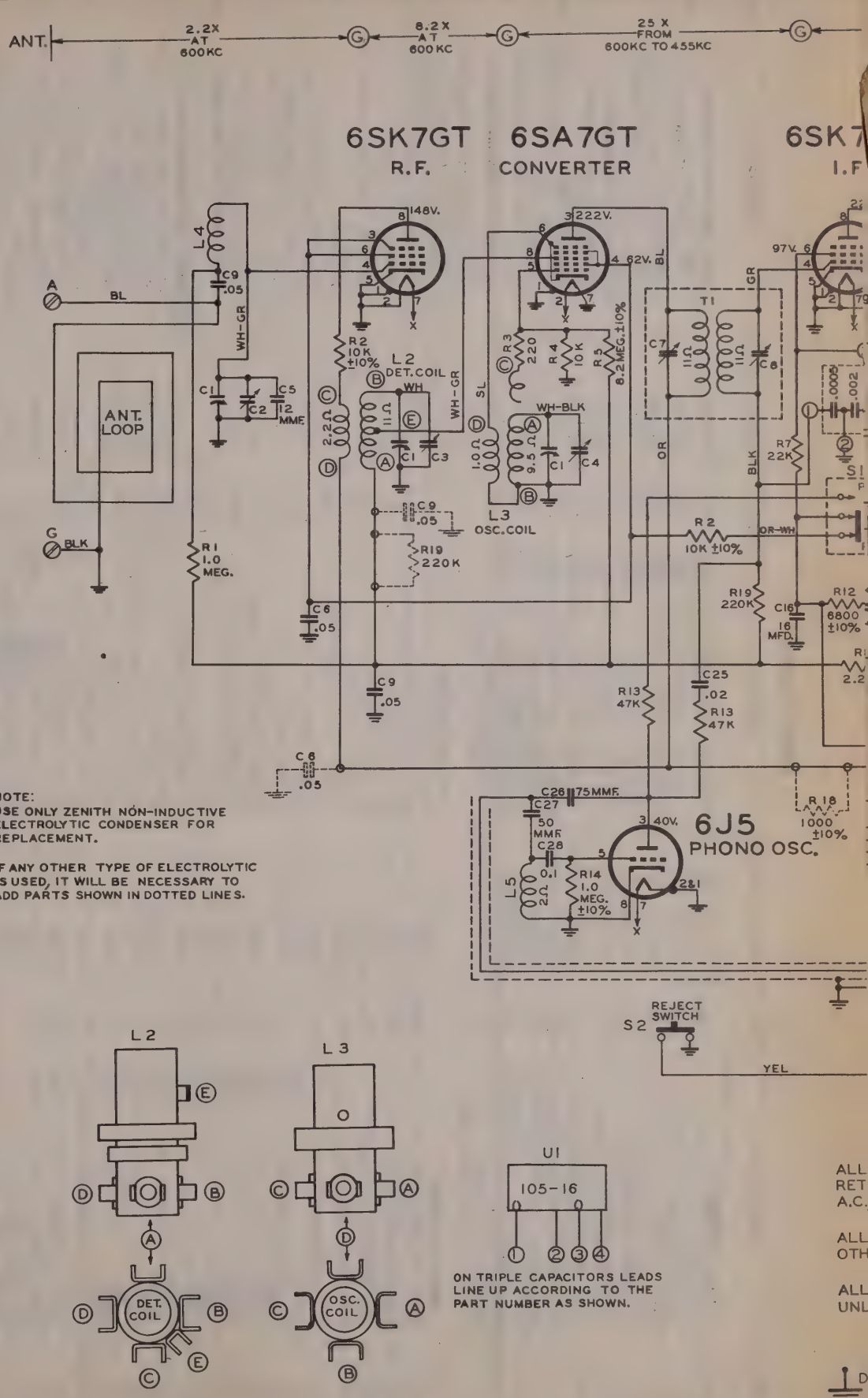
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED

AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7 M.C.

TUNING RANGES
540-1620 K.C. STD. BC.
88-108 M.C. F.M. 100

DENOTES CHASSIS

MODEL 7H822
CHASSIS 7E02



NOTE:
USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT.

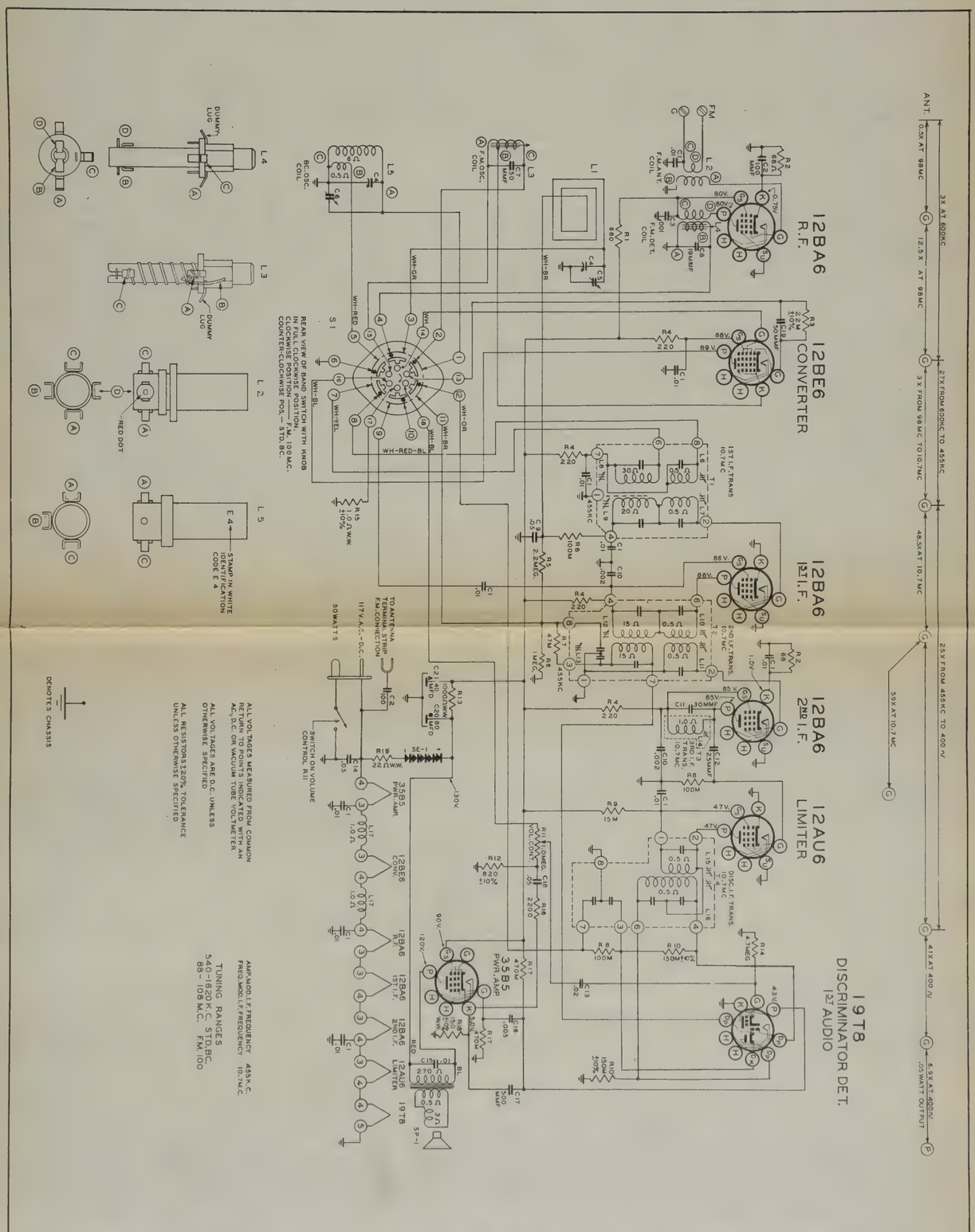
IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		MISCELLANEOUS--Continued	
49-634	SP1	P.M. Speaker - 5-1/4".	$8.25
		206-634 Output Transformer	1.97
		208-634 Cone and Voice Coil.	1.73
54-30		#8-32X5/16" Hex. Nut-Steel-N.P.	.31C
54-139		3/8-32 X 9/16" Palnut-Cads	.01
54-226		Speed Nuts (2 Used)	.01
57-1269		I.F. Transformer Terminal Plate.	.06
58-128		Two Prong Plug	.15
73-30		#6-32 X 1/4" Hex. Slotted Set Screw-Cuppoint (2 Used).	.02
78-787		Socket-Two Contact	.10
78-788		Socket-Miniature Tube (9 Contact). . . .	.35
78-806		Socket-Miniature Tube.	.15
78-807		Socket-Miniature Tube.	.15
83-1056		Wavemagnet Mtg. Strip.	.03
83-1063		Threaded Insert (Used on all I.F. Transformers	.06
83-1064		Threaded Insert (Used on all I.F. Transformers	.06
83-1090		Insulating Strip	.02
83-1498		Insulating Strip	.04
83-1520		Rectifier Insulating Strip	.03
83-1545		Insulating Strip (3 Used)	.02
85-430	S1	Band Switch	1.50
93-94		Insulating Shoulder Strip.	.01
93-125		#6 Int. Lockwasher	.31C
93-126		#8 Int. Lockwasher	.36C
93-665		Fibre Washer	.01
93-910		Felt Washer-Brown (3 Used)	.01
97-293		Chassis Mtg. Stud.	.18
112-281		#10 X 3/4" Oval Binding Hd. Self Tapping Screw Statuary Bronze.	1.20C
112-697		#6 X 7/16" Straight Side B.H. Self Tapping Sc.-Steel-Cad (Cabt.Back Mtg.)	.02
114-48		#6-32 X 1/4" Hex. Acorn Hd. M.S. Steel - N.P.	.43C
114-58		#6-32 X 3/8" Hex. Acorn Hd. M.S.-Steel-N.P.	.43C
114-78		#8 X 5/16" Hex. Hd. Slotted Self Tapping Sc. Steel N.P.	1.40C
114-92		#6 X 1-1/8" Hex. Hd. Slotted Self Tapping Sc. Cad.	1.50C
114-271		#6 X 1/4" Hex. Hd. Slotted Self Tapping Sc. Type Z Cad..	.01
149-39		Iron Core (Used on all I.F. Transformers)	.13
149-64		Iron Core & Spring (2 Used).	.40
149-66		Iron Core (Used on all I.F. Transformers).	.10
159-50		Plug Button.	.01
192-117		Dial Crystal	.75
196-111		Speaker Gasket	.55
202-506		F. M. Instruction Book	.10
202-663		Instruction Book	.10
212-3	SE1	Selenium Rectifier (or 212-4).	2.00
S14527		Wavemagnet Lead & Stop Assembly.	.20
S14549		Cabinet Back, Socket, & A.C. Cord Assembly	1.75
S14957	L1	Wavemagnet Assembly-Type 26GR.	1.25

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CPC--25M--7/48


12BA6 R.F.
12BE6 CONVERTER
12BA6 1ST I.F.
12BA6 2ND I.F.
12AU6 LIMITER
19T8 DISCRIMINATOR DET. 1ST AUDIO
35B5 PWR. AMP
REAR VIEW OF BAND SWITCH WITH KNOB IN FULL CLOCKWISE POSITION FOR F.M. 100 MC. COUNTER-CLOCKWISE POS.—STD. BC.
STAMP IN WHITE IDENTIFICATION CODE E 4
RED DOT
DUMMY LUG
DENOTES CHASSIS
ALL VOLTAGES MEASURED FROM COMMON RETURN WITH 1000 OHMS PER VOLT AC, DC OR VACUUM TUBE VOLTMETER
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED
TUNING RANGES 540-1620 K.C. STD.BC. 88-108 M.C. F.M.100
AMP.MOD.I.F.FREQUENCY 455 K.C.
FREQ.MOD.I.F.FREQUENCY 10.7 M.C.
ANT.
0.5X AT 99 MC
3X AT 600 KC
12.5X AT 99 MC
21X FROM 600 KC TO 455 KC
3X FROM 99 MC TO 10.7 MC
48.5X AT 10.7 MC
23X FROM 455 KC TO 400 V
59X AT 10.7 MC
41X AT 400 V
6.9X AT 400 V
.05 MAT OUTPUT

MODEL 7H822
CHASSIS 7E02

MODEL 7R887
CHASSIS 7E22

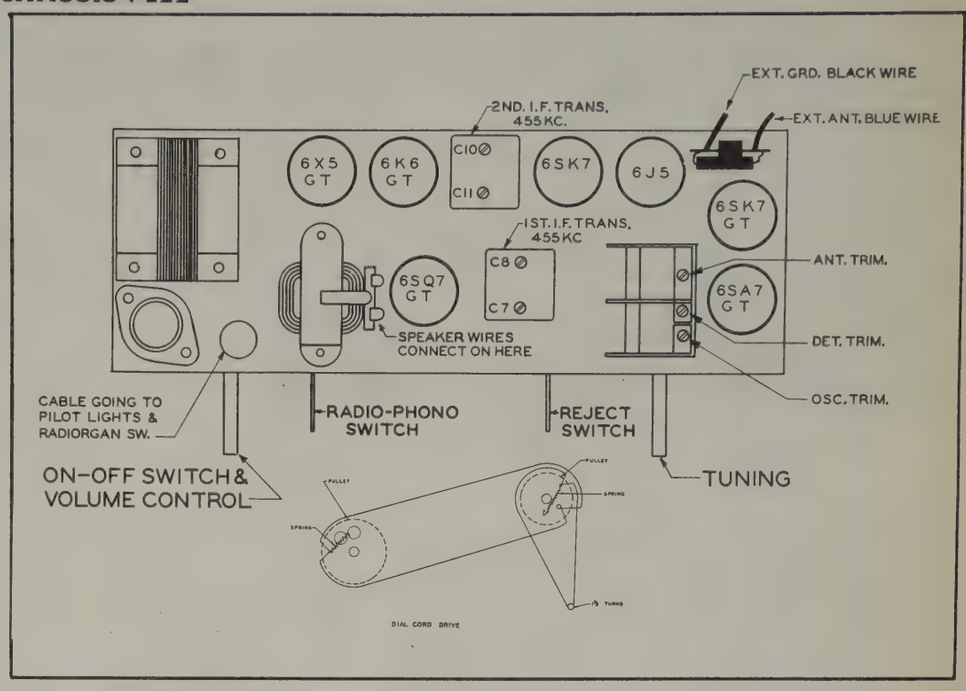
TO THE SERVICE MAN:

A feature of chassis 7E22 is a high gain tuned R.F. stage ahead of the conventional superheterodyne circuit.

When making repairs or adjustments on the chassis be sure to have the Phono-Radio switch in Radio position (button out).

The Radiogran tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

The 6SK7 1st IF tube is also the phono pre-amplifier. The output from the phono oscillator is fed to the grid of the 6SK7 through R13 and C25. The amplified output is taken from the screen grid and fed back through U1 and C14 into the volume control circuit and the grid of the 6SQ7GT 1st audio amplifier.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

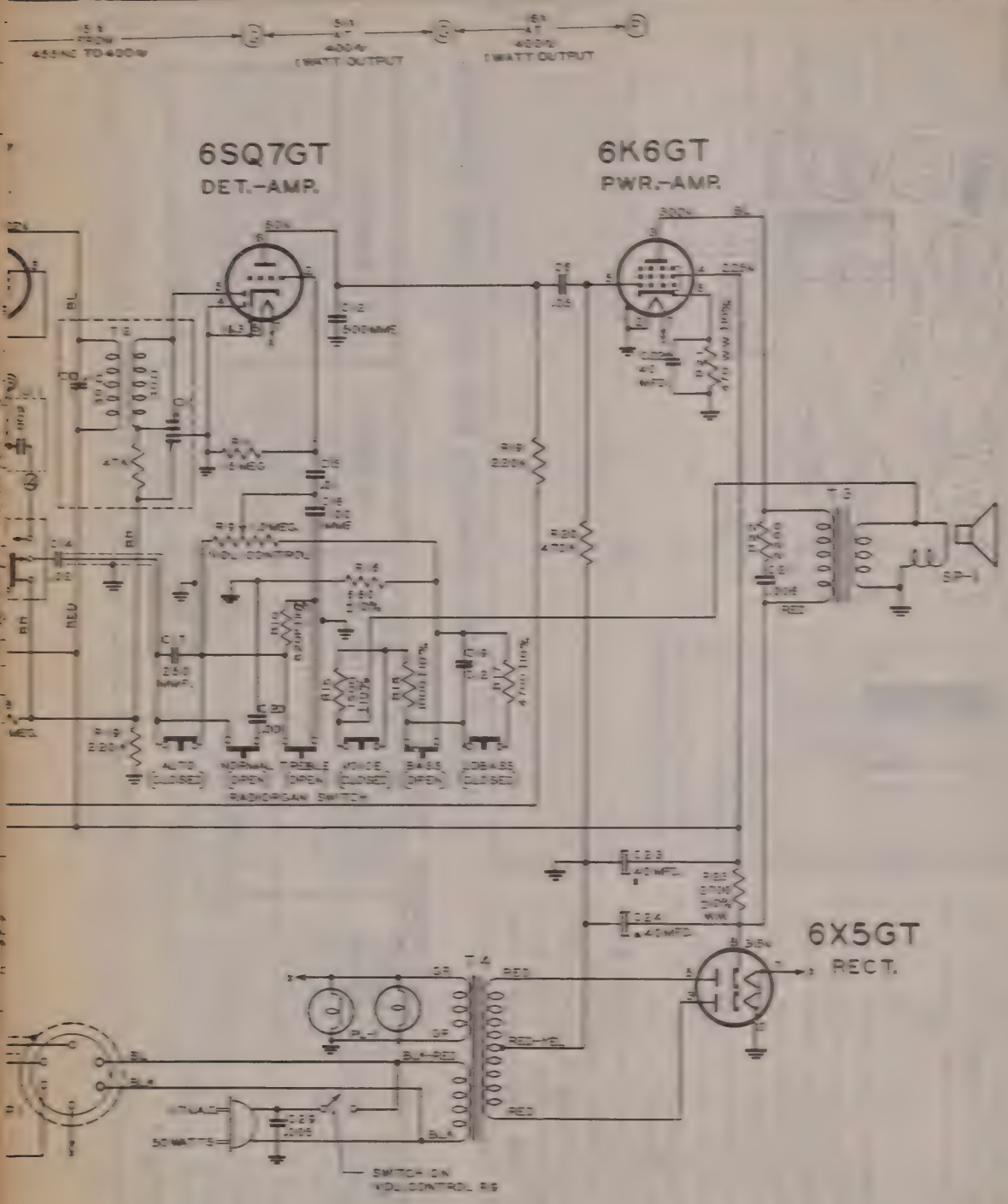
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-7, C-8 C-10, C-11	Align I. F.
2	One turn loop loosely coupled to the wavemagnet	--	1600 Kc.	1600 Kc.	Oscillator Trimmer	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc.	Detector Trimmer	Align Det.
4		--	1400 Kc.	1400 Kc.	Antenna Trimmer	Align Ant.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-402		Dial Scale	$ .40
59-213		Dial Pointer	.30
76-501		Tuning Control Shaft	.25
78-699		Dial Light Socket	.60
80-402		Dial Cord Tension Spring	.03
80-634		Pointer Retaining Spring	.02
93-690		Brown Felt Washer	.60
94-371		Pointer Pulley Bushing (S11292)	.05
100-36	PL-1	Dial Light Bulb - Mazda #44	.09
188-32		Retaining Ring (Tuning Shaft)	1.03
188-34		Retaining Ring (Pointer Pulley)	1.20
S-11292		Pointer Pulley & Bushing Assem. (59-213)	.16
S11358		Dial Cord & Eyelet Assem. (Short)	.05
S14475		Pulley & Bushing Assem.	.35
S14477		Dial Plate & Stud Assem.	.70
S14478		Dial Cord & Eyelet Assem. (Long)	.06
		COILS & CHOKES	
95-1091	T1	1st. I. F. Transformer	1.95
95-1092	T2	2nd. I. F. Transformer	2.20
S11163	L2	Detector Coil Assembly	.71
S12603	L5	Pre-Amp Oscillator Coil Assembly	2.02
S14195	L4	Loop Loading Coil Assembly	.65
S14654	L3	Oscillator Coil Assembly	.50
		CONDENSERS	
22-171	C6	.05MFD 600V.	.26
22-182	C17	.00025MFD. (or 22-1666) 500V.	.26
22-188	C14	.02MFD 400V.	.20
22-243	C15	.01MFD 400V.	.20
22-365	C18	.0001MFD 500V.	.20
22-458	C21	.006MFD. 600V.	.20
22-530	C5	12MMFD 500V.	.20
22-829	C9	.05MFD 200V.	.20
22-830	C25	.02MFD 600V.	.20
22-854	C12	.0005MFD 600V.	.20
22-887	C20	.001MFD. 600V.	.20
22-1041	C29	.005MFD. 400V.	.20
22-1256	C26	75MMFD. (or 22-1746) 500V.	.20
22-1418	C28	.1MFD. 200V.	.20
22-1531	C19	.2MFD. 200V.	.20
22-1720	C22,23,24	Electrolytic 40MFD.-25V.X40-40MFD. 450V	3.85
22-1755	C16	16MFD. Electrolytic. 300V.	1.40
22-1761	C27	500MMFD. Ceramic. 500V.	.20
22-1772	C1	Three Gang Variable.	3.50
105-16	U1	.0005 MFD - 400V. .002 MFD - 400V. .002 MFD - 400V.	
		RESISTORS	
63-1071	R2	10K Ohm (Insulated). 1W.	.24
63-1534	R23	2700 Ohm . (Insulated) W.W 4W.	
63-1222	R21	470 Ohm. . (Insulated) W.W 1W.	.24
63-1571	R12	6800 Ohm . (Insulated) 2W.	.33
63-1648	R9	Volume Control & Switch.	1.81
63-1758	R3	220 Ohm. . (Insulated) 1/2W.	.21
63-1778	R16	680 Ohm. . (Insulated). 1/2W.	$0.21
63-1785	R18	1000 Ohm . .(Insulated). 1/2W.	.21
63-1792	R15	1500 Ohm . .(Insulated). 1/2W.	.21
63-1800	R22	2200 Ohm . .(Insulated). 1/2W.	.21
63-1813	R17	4700 Ohm . .(Insulated). 1/2W.	.21
63-1828	R4	10K Ohm. . .(Insulated). 1/2W.	.21
63-1842	R7	22K Ohm. . .(Insulated). 1/2W.	.21
63-1855	R13	47K Ohm. . .(Insulated). 1/2W.	.21
63-1884	R19	220K Ohm . .(Insulated). 1/2W.	.21
63-1898	R20	470K Ohm . .(Insulated). 1/2W.	.21
63-1908	R10	820 K Ohm. .(Insulated). 1/2W.	.21
63-1911	R14	1 Megohm . .(Insulated). 1/2W.	.21
63-1912	R1	1 Megohm. . .(Insulated). 1/2W.	.21
63-1926	R8	2.2 Megohm .(Insulated). 1/2W.	.21
63-1950	R5	8.2 Megohm .(Insulated). 1/2W.	.21
63-1961	R11	15 Megohm. .(Insulated). 1/2W.	.21
		MISCELLANEOUS	
2-133		Cabinet Back	2.50
11-104		Line Cord & Plug - 7 Ft. Long.	.65
12-886		Tuning Shaft Bracket	.03
12-1187		Dial Plate Bracket - R.H	.15
12-1188		Dial Plate Bracket - L.H	.15
15-82		Plug Cap & Insulator	.10
19-169		Record Changer Mounting Clip (4 Used)	.07
46-697		Tuning & Volume Control Knob	.10
46-726		Phono Switch Knob	.10
49-636	SP-1	10" P.M. Speaker	11.75
		208-636 Cone & Voice Coil	3.41
54-30		#8-32X5/16" Hd. Nut-Steel-N.P. (Speaker Mtg.)	.31C
54-139		#3/8-32X9/16" Palnut Cad	.01
54-143		Speed Nut	.03
54-228		Speed Nut (Trim Strip Mtg.)	.75C
54-267		#6-32X5/16" Palnut-Steel-Cad. (4 Used)	.45C
57-1380		Dial Escutcheon	3.00
70-83		#6X1/2" Washer Hd. Wood Screw (12 Used) (Cabinet Back)	.55C
72-59		#2X1/2" Flat Phillips Hd. Wood Screw-Steel Brass Plate	.02
73-35		#8-32X3/16" Hex. Hd. Slotted Set Screw-Cuppoint (2 Used)	.03
78-709		Socket-Octal Tube	.20
78-750	P1	Socket-Phono Cable	.25
78-793		Socket-Octal Tube (6 Used)	.15
80-463		Record Changer Mtg. Spring (4 Used)	.03
80-604		Hinge Spring (2 Used)	.15
83-765		Armite Strip (3 Used)	.02
83-1245		Record Changer Trim Strip	1.00
83-1501		Escutcheon Trim Strip	.40
83-1521		Dial Crystal Rubber Strip	.20
85-422	S2	Reject Switch	.40
85-425	S1	Phono-Radio Switch	.70
93-35		.032 x 144 x 3/8" Steel Washer-N.P. (3 Used)	.25C
93-J25		#6 Int. Shakeproof Lockwasher #1206 (2 Used)	$0.31C
93-392		3/32" X 33/64" X 1" Brown Felt Washer (2 Used)	1.20C
93-525		1/16" X .127 X 5/16" Fibre Washer	.65C
93-897		1/16" X 13/64" X 1" Steel Washer-Cad.	.04
94-295		Condenser Mounting Bushing	.04
94-584		Gang Condenser Pulley Bushing	.20
95-1093		Output Transformer	2.25
95-1094		Power Transformer	8.50
112-56		#6X1/4" Hex. Hd. Self Tapping Screw (2 Used)	.55C
112-350		#10X1-3/4" R.H. Self Tapping Screw-Type Z	.03
112-712		Record Changer Mounting Screw (4 Used)	.08
114-26		#8X1/4" Hex. Hd. Self Tapping Screw	.55C
114-58		#6-32-X3/8" Hex. Acorn Hd. M.S. -Steel-N.P	.43C
114-128		#10X1-1/16" Hex. Washer Hd. Self Tapping Screw (4 Used)	1.81C
125-17		Rubber Grommet (5 Used)	.03
125-26		Rubber Grommet (2 Used)	.03
159-50		Snap Button-Black Oxidize Finish (5 Used)	.01
192-119		Dial Crystal	.25
196-81		Dial Crystal Dust Gasket	.40
202-602		Instruction Book (Radio & Phono)	.10
S-14004		Non-Intermixer Record Changer	.?
S-14531		Record Changer Compartment Hinge Assem. (R.H.)	2.50
S-14532		Record Changer Compartment Hinge Assem. (L.H.)	2.50
S-14557		Record Changer Mtg. Frame Assem.	3.50
		RADIORGAN ESCUTCHEON PARTS	
57-1381		Radiorgan Escutcheon (R.H.)	.75
57-1382		Radiorgan Escutcheon (L.H.)	.75
76-444		Radiorgan Knob Shaft (2 Used)	.04
80-639		Radiogran Retaining Spring (2 Used)	.05
112-723		#6X7/32" Rd. Phillips Hd. Self Tapping Screw	1.30C
S-14255		Radiorgan Mounting Bracket Assem	.15
S-14261		Radiorgan Strip & Contact Assem. (2 Used)	.15
S-14273		Radiorgan Knob & Eyelet Assem.-Lo-Bass	.20
S-14274		Radiorgan Knob & Eyelet Assem.Bass	.20
S-14276		Radiorgan Knob & Eyelet Assem.Treble	.20
S-14277		Radiorgan Knob & Eyelet Assem.Alto	.20
S-14278		Radiorgan Knob & Eyelet Assem. Normal	.20
S-14554		Radiorgan Escutcheon & Knob Assem. (R.H.)	1.75
S-14555		Radiorgan Escutcheon & Knob Assem. (L.H.)	1.75
S-14663		Radiorgan Knob & Eyelet Assem. - Voice	.20

PRICES SUBECT TO CHANGE WITHOUT NOTICE.



VOLTAGES MEASURED FROM COMMON
RN TO POINTS INDICATED WITH AN
D.C. OR VACUUM TUBE VOLTMETER

VOLTAGES ARE D.C. UNLESS
ERWISE SPECIFIED

RESISTORS ±20% TOLERANCE
ESS OTHERWISE SPECIFIED

ENOTES CHASSIS

I.F. FREQUENCY 455 K.C.

TUNING RANGE
535 —— 1620 K.C.

PARTS LIST

PART NO.	DIAL ASSEMBLY	PRICE
26-326	DIAL SCALE	.50
78-441	TUNING CONTROL SHAFT	.20
78-600	DIAL LIGHT SOCKET & WIRE	.60
80-402	DIAL CORD TENSION SPRING	.03
80-444	TUNER ARM TENSION SPRING	.05
80-445	TUNER ARM PRESSURE SPRING	.10
100-87	DIAL LIGHT BULB	.10
188-30	RETAINING RING	1.20C
188-34	RETAINING RING (USED ON S-10953)	1.20C
S-10946	DIAL WITH PLATE & STUD ASSEM	.60
S-10953	POINTER & PULLEY ASSEM. (59-148)	.40
S-11357	POINTER PULLEY CORD & EYELET ASSEM.	.05
S-11358	DRIVE PULLEY CORD & EYELET ASSEM	.05
S-11810	TONE CONTROL SW. ARM & SLEEVE ASSEM.	.25
S-12238	TUNER ARM & SPRING ASSEM.	.90
S-12239	TUNING COND. PULLEY & CAM ASSEM.	.35

COILS AND CHOKES

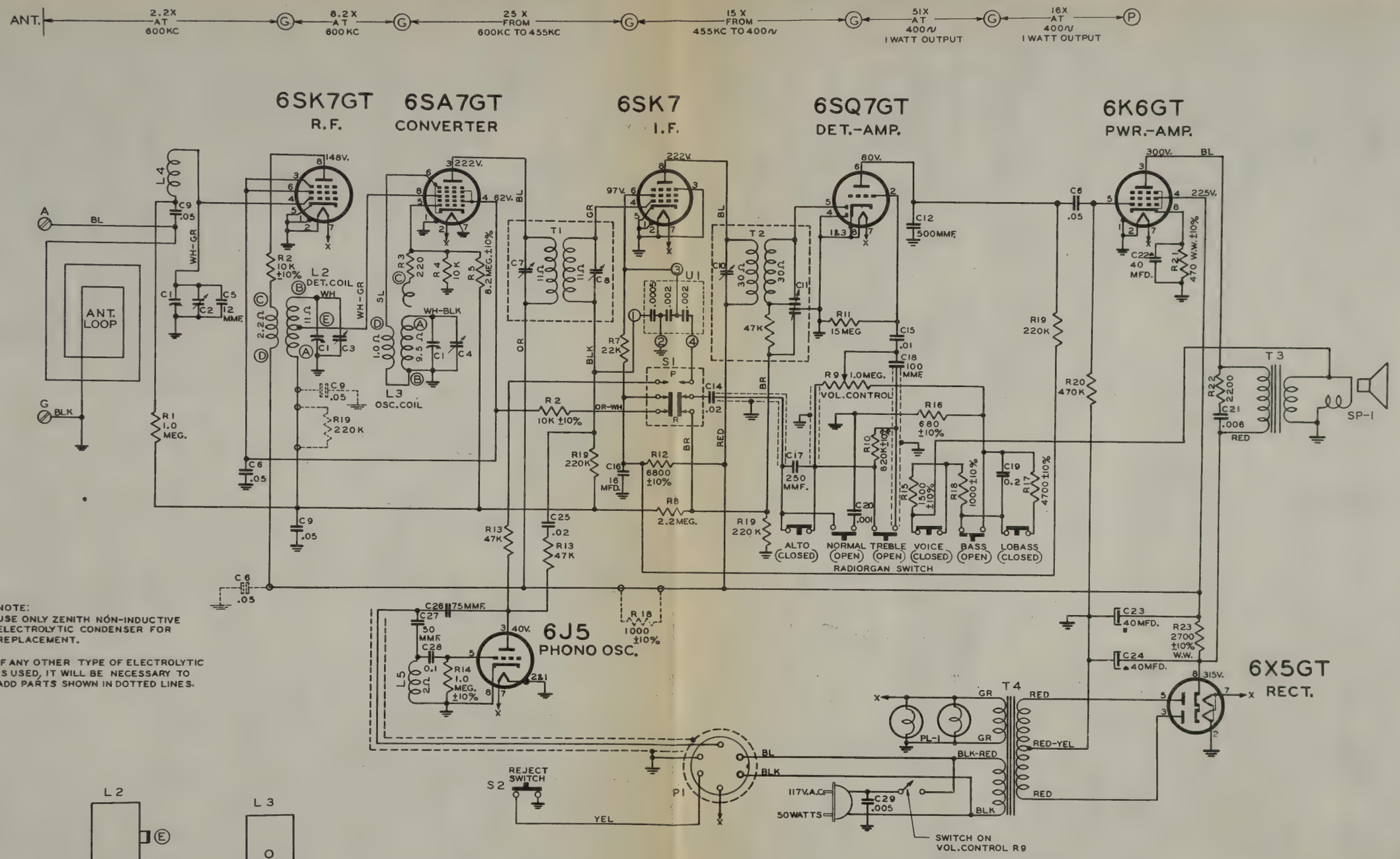
S-8826	WAVE TRAP COIL ASSEM. (L5)	.25
S13564	B. C. DETECTOR COIL ASSEM. (L4)	.47
S-11157	B. C. OSCILLATOR COIL ASSEM. (L6)	.53
S-12249	1ST I. F. TRANSFORMER ASSEM. (T1)	3.47
S-13571	2ND I. F. TRANSFORMER ASSEM. (T2)	3.72
S-11052	DISCRIMINATOR TRANSFORMER ASSEM. (T3)	2.78
S-11856	A. C. LINE CHOKE COIL ASSEM. (L8)	.35
S-11857	F. M. ANTENNA COIL ASSEM. (L1)	.44
S-12258	F. M. DETECTOR COIL ASSEM. (L3)	.45
S-11899	F. M. OSCILLATOR COIL ASSEM. (L7)	.33
S-12488	3RD I. F. TRANSFORMER ASSEM. (T3)	4.38

CONDENSERS

22-162	100 MMFD. (C10)	500 V.	.20
22-182	250 MMFD. (C12)	600 V.	.25
22-156	.01 MFD. (C22)	600 V.	.20
22-288	.003 MFD. (C28)	600 V	.20
22-829	.05 MFD. (C19)	200 V.	.20
22-830	.02 MFD. (C25)	600 V.	.20
22-1017	.05 MFD. (C32)	200 V	.20
22-1147	100 MFD. (C27)	400 V	.40
22-1136	500 MMFD. (C24)	600 V	.30
22-1359	THREE GANG VARIABLE (C1)		5.50
22-1366	DRY ELECTROLYTIC - 40 x 40 MFD. 150 V. X 40 MFD. - 25 V. (C29, C30 & C31)		1.70
22-1367	50 MMFD. (C16)	500 V. (CERAMIC)	.35
22-1385	.01 MFD. (C3)	200 V	.20
22-1386	.01 MFD. (C20)	200 V	.10
22-1388	TRIMMER (WAVE TRAP) (C9)		.35
22-1439	.001 MFD. (C21)	200 V	.20
22-1485	TRIMMER (F. M. ANT.) (C5)		.45
22-1486	TRIMMER (F. M. DET.) (C15)		.45
22-1488	100 MMFD. (C4)	300 V	.28
22-1489	10 MMFD. (C8)	500 V (SILVER ON CERAMIC)	.23
22-1490	18 MMFD. (C13)	500 V. (SILVER ON CERAMIC)	.32
22-1491	20 MMFD. (C5)	500 V. (SILVER ON CERAMIC)	.27
22-1513	50 MMF. CERAMIC (C17)		
22-1509	52 MMF. CERAMIC (C33)		.33
22-1531	.2 MFD. (C26)	200 V	.20
22-1646	TRIMMER (F.M.OSC) (C14)		
22-1635	20 MFD. ELECTRO 150 V. (C23)		

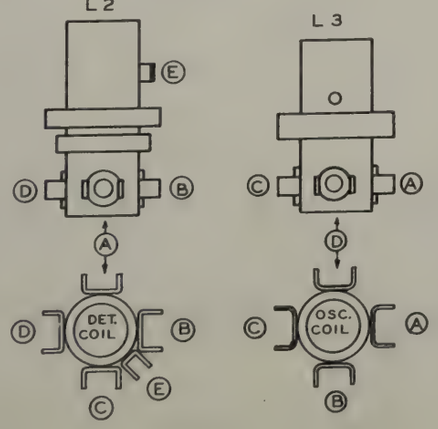
RESISTORS

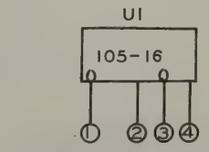
63-286	220 M (R11)	1/2 W	.09
63-445	100 M OHM (R12)	1/2 W WWSL	.18
63-579	220 OHM (R7)	1/8 W	.09
63-582	680 OHM (R2)	1/8 W	.09
63-583	1000 OHM 1/2 W (R10)		
63-586	3300 OHM (R9)	1/2 W	.09
63-593	47M OHM (R8)	1/2 W	.09
63-597	470M OHM (R17)	1/2 W	.09



NOTE:
USE ONLY ZENITH NÓN-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT.

IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.





ON TRIPLE CAPACITORS LEADS LINE UP ACCORDING TO THE PART NUMBER AS SHOWN.

ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED

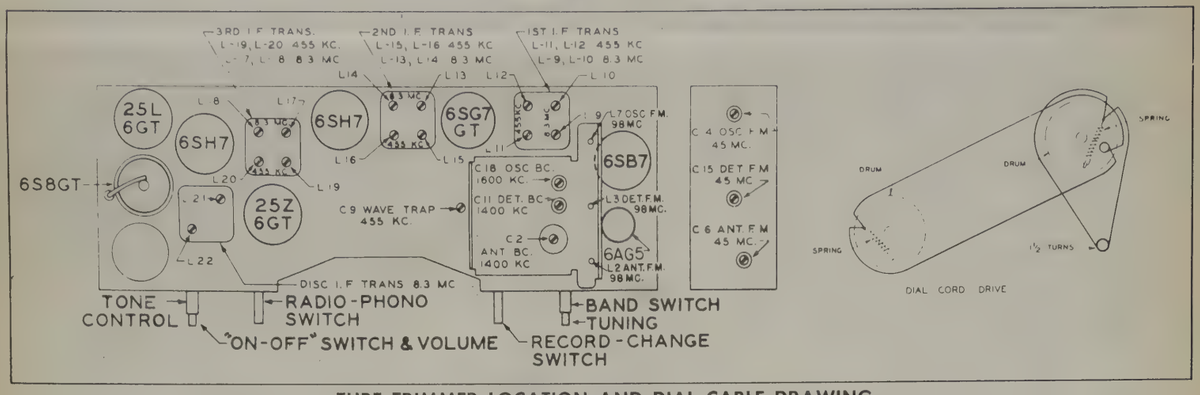
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED

DENOTES CHASSIS

I.F. FREQUENCY 455K.C.

TUNING RANGE
535 —— 1620K.C.

MODELS 8H023 – 8H034
CHASSIS No. 8C01



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 8C01 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

When adjustments are made on the 8C01 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments. The second 8.3 Mc If Stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. THE LOAD RESISTER MUST BE REMOVED AFTER ALIGNMENT.

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 6) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SE7 Socket	.05 Mfa.	455 Kc. Modulated	BC	600 Kc.	L-11,12,15,16, 19 and 20	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	C9	Adjust wavetrap for minimum output
3	2 turns loosely cpla. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C18	Set oscillator to dial scale
4	2 turns loosely cpla. to wavemagnet	.05 Mfa.	1400 Kc. Modulated	BC	1400 Kc.	C11 & C2	Align det. and ant. stages.
5 (a)	Pin 4(grid)on 6SH7 limiter socket	.05 Mfa.	8.3 Mc. Unmodulated	FM 45		L21 coil slug Primary discr.	Align primary of discrimator for maximum reading
6 (b)	Pin 4(grid)on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L22 coil slug sec. of disc.	Adjust secondary of discriminator for zero reading
7 (c)	Pin 4 (grid) on 6SH7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L17 & L18 Prim.& Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading
8(c)(d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L13 & L14 primary and sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
9(c)(d)	Pin 8 (grid) on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L9 & L10 Primary & Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
10 (c)	Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil slug	Set oscillator to dial scale
11 (c)	Antenna Post (Remove line ant.)	270 onms	98 Mc Unmodulated	FM 100	98 Mc	L3 & L2 Det. and RF coil slugs	Align det. and ant. stages to maximum reading
12 (c)	Antenna Post (Remove line ant.)	270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C14	Set oscillator to dial scale
13 (c)	Antenna Post (Remove line ant.)	270 onms	45 Mc. Unmodulated	FM 45	45 Mc.	C15 & C6	Align detector & ant. stages for maximum reading.

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 onms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

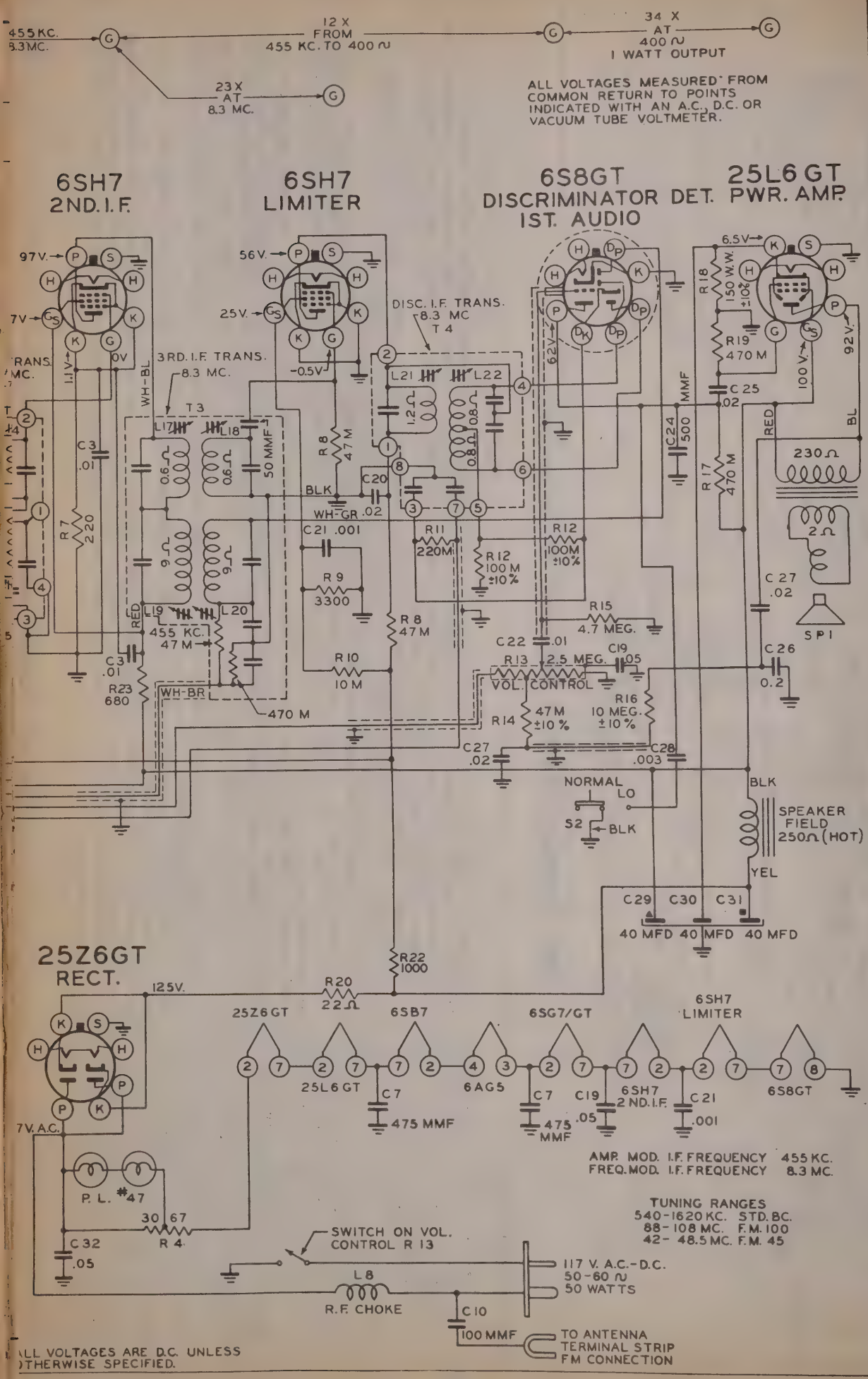
(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4) to chassis.

(d) 300 ohm ½ watt carbon resistor soldered across the secondary L14 (pin 2 and 3 of 2nd, IF trans.). The leads to the resistor must be as short as possible and the resistor removed before operation 10 is started.

PARTS LIST

PART NO.		PRICE
	DIAL ASSEMBLY	
26-326	DIAL SCALE	.50
76-441	TUNING CONTROL SHAFT	.20
78-600	DIAL LIGHT SOCKET & WIRE	.80
80-402	DIAL CORD TENSION SPRING	.03
80-444	TUNER ARM TENSION SPRING	.05
80-445	TUNER ARM PRESSURE SPRING	.10
100-67	DIAL LIGHT BULB	1.20C
188-30	RETAINING RING	1.20C
188-34	RETAINING RING (USED ON S-10953)	.63
S-10945	DIAL MTG. PLATE & STUD ASSEM.	.40
S-10953	POINTER & PULLEY ASSEM. (59-148)	.05
S-11357	POINTER PULLEY CORD & EYELET ASSEM.	.05
S-11358	DRIVE PULLEY CORD & EYELET ASSEM.	.05
S-11810	TONE CONTROL SW. ARM & SLEEVE ASSEM.	.25
S-12238	TUNER ARM & SPRING ASSEM.	.90
S-12239	TUNING COND. PULLEY & CAM ASSEM.	.36
	COILS AND CHOKES	
S-8326	WAVE TRAP COIL ASSEM. (L5)	.28
S13564	B. C. DETECTOR COIL ASSEM. (L4)	.47
S-11157	B. C. OSCILLATOR COIL ASSEM. (L6)	.53
S-12249	1ST. I. F. TRANSFORMER ASSEM. (T1)	3.47
S-13571	2ND I. F. TRANSFORMER ASSEM. (T2)	3.72
S-12252	DISCRIMINATOR TRANSFORMER ASSEM. (T4)	2.78
S-11256	A. C. LINE CHOKE COIL ASSEM. (L8)	.35
S-12257	F. M. ANTENNA COIL ASSEM. (L2)	.44
S-12258	F. M. DETECTOR COIL ASSEM. (L3)	.45
S-12259	F. M. OSCILLATOR COIL ASSEM. (L7)	.33
S-12488	3rd I. F. TRANSFORMER ASSEM. (T3)	4.38
	CONDENSERS	
22-162	100 MMFD. (C10)	600 V .20
22-182	250 MMFD. (C12)	600 V .26
22-196	.01 MFD. (C22)	600 V .20
22-288	.003 MFD. (C28)	600 V .20
22-829	.05 MFD. (C19)	200 V .20
22-830	.02 MFD. (C25)	600 V .20
22-1017	.05 MFD. (C32)	200 V .20
22-1127	.02 MFD. (C27)	200 V .20
22-1138	500 MMFD. (C24)	400 V .20
22-1359	THREE GANG VARIABLE (C1) DRY ELECTROLYTIC - 40 X 40 MFD. 150 V. X 40 MFD.	600 V 5.50
22-1366		1.70
22-1367	50 MMFD. (C16)	500 V (CERAMIC) .33
22-1385	.01 MFD. (C3)	200 V .20
22-1386	.02 MFD. (C20)	200 V .20
22-1388	TRIMMER (WAVE TRAP) (C9)	.35
22-1439	.001 MFD. (C21)	200 V .20
22-1485	TRIMMER (F. M. ANT.) (C6)	.45
22-1486	TRIMMER (F. M. DET.) (C15)	.45
22-1488	100 MMFD. (C4)	300 V .28
22-1489	10 MMFD. (C8)	500 V (SILVER ON CERAMIC) .23
22-1490	18 MMFD. (C13)	500 V (SILVER ON CERAMIC) .32
22-1491	20 MMFD. (C5)	500 V (SILVER ON CERAMIC) .27
22-1513	50 MMF. CERAMIC (C17)	
22-1509	52 MMF. CERAMIC (C33)	
22-1531	.2 MFD. (C26)	200 V .33
22-1646	TRIMMER (F.M. OSC) (C14)	.20
22-1635	20 MFD. ELECTRO 150 V. (C23)	
	RESISTORS	
63-296	220 M (R11)	1 W. INSL. .09
63-445	100 M OHM (R12)	½ W. .19
63-579	220 OHM (R7)	½ W. .09
63-582	680 OHM (R2)	½ W. .09
63-583	1000 OHM ± W (R22)	½ W. .09
63-586	3300 OHM (R9)	½ W. .09
63-593	47M OHM KR8)	½ W. .09
63-597	470M OHM (R17)	½ W. .09


455 KC. 8.3 MC.
12 X FROM 455 KC. TO 400 ~
34 X AT 400 ~ 1 WATT OUTPUT
23 X AT 8.3 MC.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
6SH7 2ND. I.F.
6SH7 LIMITER
6S8GT DISCRIMINATOR DET. 1ST. AUDIO
25L6 GT PWR. AMP.
DISC. I.F. TRANS. 8.3 MC T 4
3RD. I.F. TRANS. 8.3 MC.
T3
455 KC. 47 M
470 M
VOL. CONTROL
NORMAL LO
S2
SPEAKER FIELD 250Ω (HOT)
40 MFD 40 MFD 40 MFD
25Z6GT RECT.
125V.
7V. A.C.
P. L. #47
SWITCH ON VOL. CONTROL R 13
117 V. A.C.-D.C. 50-60 ~ 50 WATTS
R.F. CHOKE
100 MMF
TO ANTENNA TERMINAL STRIP FM CONNECTION
AMP. MOD. I.F. FREQUENCY 455 KC.
FREQ. MOD. I.F. FREQUENCY 8.3 MC.
TUNING RANGES
540-1620 KC. STD. BC.
88-108 MC. F.M. 100
42-48.5 MC. F.M. 45
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

MODELS 8H023-8H034
CHASSIS No. 8C01

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION		PRICE
		DIAL ASSEMBLY		
26-326		Dial Scale		.50
76-441		Tuning control shaft		.20
78-600		Dial light socket & wire		.80
80-402		Dial cord tension spring		.03
80-444		Tuner arm tension spring		.05
80-445		Tuner arm pressure spring		.10
100-67		Dial light bulb		.10
188-30		Retaining ring		1.20C
188-34		Retaining ring (used on S-10953)		1.20C
S-10945		Dial mtg. plate & stud assem.		.63
S-10953		Pointer & pulley assem. (59-148)		.40
S-11357		Pointer pulley cord & eyelet assem.		.05
S-11358		Drive pulley cord & eyelet assem.		.05
S-11810		Tone control sw. arm & sleeve assem		.25
S-12238		Tuner arm & spring assem.		.90
S-12239		Tuning cond. pulley & cam assem		.36
		COILS AND CHOKES		
S-8326	L5	Wave trap coil assem.		.28
S-13835	L4	B. C. detector coil assem.		.60
S-11157	L6	B. C. oscillator coil assem		.53
S-12249	T1	1st I. F. transformer assem		3.47
S-13571	T2	2nd I. F. transformer assem..		3.72
S-12252	T4	Discriminator transformer assem		2.78
S-11256	L8	A. C. line choke coil assem		.35
S-12257	L2	F. M. antenna coil assem.		.44
S-12258	L3	F. M. detector coil assem		.45
S-12259	L7	F. M. oscillator coil assem		.33
S-12488	T3	3rd I. F. transformer assem		4.38
		CONDENSERS		
22-162	C10	100 mmfd.	500 Volt.	.20
22-182	C12	250 mmfd.	600 Volt.	.26
22-196	C22	.01 mfd	600 Volt.	.20
22-288	C28	.003 mfd.	600 Volt.	.20
22-829	C19	.05 mfd	200 Volt.	.20
22-830	C25	.02 mfd	600 Volt.	.20
22-1017	C32	.05 mfd	200 Volt.	.20
22-1127	C27	.02 mfd	400 Volt.	.20
22-1138	C24	500 mmfd.	600 Volt.	.20
22-1359	C1	Three gang variable		5.50
22-1366	C29,C30 & C31	Dry electrolytic - 40 x 40 mfd. 150 V. x 40 mfd. 25 V		1.70
22-1367	C16	50 mmfd	500 Volt.	.33
22-1385	C3	.01 mfd	200 Volt.	.20
22-1386	C20	.02 mfd	200 Volt.	.20
22-1388	C9	Trimmer (wave trap)		.35
22-1439	C21	.001 mfd.	200 Volt.	.20
22-1485	C6	Trimmer (F. M. ant.)		.45
22-1486	C15	Trimmer (F.M. det.)		.45
22-1488	C4	100 mmfd.	300 Volt.	.28
22-1489	C8	10 mmfd	500 Volt.	.23
22-1490	C13	18 mmfd	500 Volt.	.32
22-1491	C5	20 mmfd	500 Volt.	.27
22-1513	C17	50 mmf. ceramic		.28
22-1509	C33	52 mmf. ceramic		.33
22-1531	C26	.2 mfd.	200 Volt.	.20
22-1646	C14	Trimmer (F.M. osc).		.35
22-1635	C23	20 mfd. electro	150 Volt.	1.00
		RESISTORS		
63-296	R11	220 M	1/4 Watt.	.09
63-445	R12	100 M ohm	1/4 Watt.	.19
63-579	R7	220 ohm	1/4 Watt.	.09
63-582	R2	680 ohm	1/4 Watt.	.09
63-583	R22	1000 ohm.	1/4 Watt.	.09
63-586	R9	3300 ohm.	1/4 Watt.	.09
63-593	R8	47M ohm	1/4 Watt.	.09
63-597	R17	470M ohm.	1/4 Watt.	.09

PARTS LIST

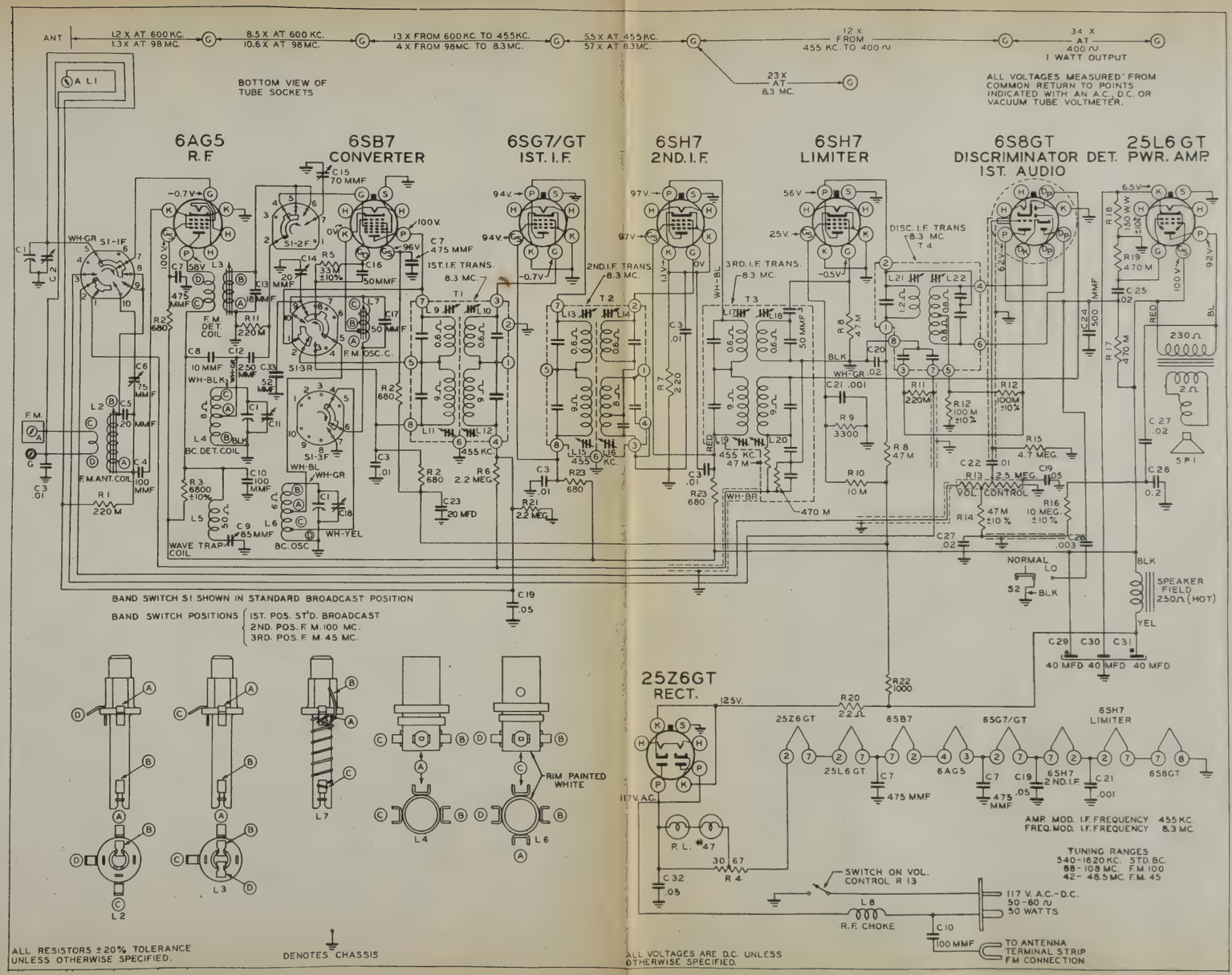
PART NO.	RESISTORS - Continued	PRICE
63-600	2.2 MEGOHM (R21) ..... ½ W.	
63-602	4.7 MEGOHM (R15) ..... ½ W.	.09
63-639	6800 OHM (R3) ..... ½ W.	.09
63-674	10 MEGOHM (R16) ..... ½ W.	.09
63-702	680 OHM (R23) ..... ½ W.	
63-717	220M OHM (R1) ..... ½ W. INSL	.19
63-719	470M OHM (R19) ..... ½ W. INSL	.19
63-722	2.2 MEGOHM (R6) ..... ½ W. INSL	.19
63-765	33M OHM (R5) ..... ½ W. INSL	.19
63-767	47M OHM (R14) ..... ½ W. INSL	.19
63-1216	10M OHM (R10) ..... 1 W. INSL	.24
63-1237	150 OHM W. W. (R18) ..... ½ W. INSL	.21
63-1336	VOL CONTROL & SW. (R13)	1.81
63-1339	TWO SECTION CANDOHM (OR 63-1464) (R4)	.84
63-1450	22 OHM W. W. (R20) ..... 1 W. INSL	.24

MISCELLANEOUS

11-85	A. C. LINE CORD & PLUG	.65
14-923	MODEL 023 BAKELITE CABINET (WALNUT)	6.60
14-923W	MODEL 023W BAKELITE CABINET (WHITE)	8.00
14-923Y	MODEL 023Y BAKELITE CABINET (BLACK)	8.00
19-139	CABINET BACK RETAINING CLIP (4 USED)	.03
27-87	SILVER MICA DISC (475 MMFD.) (C7)	.03
46-521	TUNING & TONE CONTROL KNOB (2 USED)	.12
46-538	TUNING & TONE CONTROL KNOB (2 USED) (034 & 034G)	.10
49-516	5" DYNAMIC SPEAKER	8.00
	207-516 OUTPUT TRANSFORMER	1.97
	107-516 FIELD COIL (NOT REPLACEABLE)	
	208-516 CONE & VOICE COIL	1.73
57-1054	SPARK PLATE	.10
57-1063	ESCUTCHEON PLATE (034 & 034G)	5.70
58-128	TWO PRONG A. C. MALE PLUG	.15
78-194	SOCKET - TWO CONTACT (USED ON CABINET BACKS)	.12
78-439	SOCKET - MINIATURE TUBE	.12
78-611	SOCKET - OCTAL TUBE (8 CONTACT)	.12
80-372	TUBE RETAINING SPRING	.10
83-1128	INSULATING STRIP (TONE CON. SW.)	.02
85-365	TONE CONTROL SW.	.30
93-93	BAKELITE WASHER (USED ON VOL. CONTROL)	.01
93-94	BAKELITE SHOULDER WASHER (USED ON VOL. CON.)	.01
94-485	INSULATING BUSHING (USED ON VOL. CON.)	.03
97-217	INSULATING CHASSIS MTG. STUD (4 USED)	.17
112-540	CHASSIS MTG. SCREW (4 USED)	.02
114-196	CHASSIS MTG. SCREW (4 USED) (034 & 034G)	.05
126-379	TUBE SHIELD (FOR 6SG7GT)	.07
126-382	TUBE SHIELD	.08
139-58	BAFFLE BOARD (034 & 034G)	.40
149-54	TUNING CORE & SPRING (3 USED)	.60
188-48	CONTROL KNOB DECORATIVE RING (USED ON S11558)	.04
188-54	TUNING KNOB CLAMPING RING	.02
188-102	TONE CON . CLAMPING RING	.02
192-81	DIAL CRYSTAL (023 & 023Y)	2.27
192-91	DIAL CRYSTAL)034 & 034G)	.64
192-106	DIAL CRYSTAL (023W)	2.27
196-76	DIAL CRYSTAL GASKET (034)	.10
196-82	DIAL CRYSTAL GASKET (034G)	.10
202-383	INSTRUCTION BOOK	.10
S-11135	WAVEMAGNET ASSEM. (#29) (L1)	.75
S-11558	VOLUME CONTROL KNOB & RING ASSEM. (46-520)	.28
S-11619	CABINET BACK SOCKET & A. C. CORD ASSEM. (034 & 034G)	2.30
S-11622	CABINET BACK SOCKET & A. C. CORD ASSEM. (023 & 023Y)	2.15
S-11808	CABINET BACK SOCKET & A. C. CORD ASSEM. (023W)	2.45
S-12305	BAND SW. KNOB & RING ASSEM. (46-598)	.32
S-12490	BAND SW. & SPARK PLATE ASSEM. (85-384)	4.27
S-12687	GRILLE CLOTH & SCREEN ASSEM. (034)	1.20
S-13122	GRILLE CLOTH & SCREEN ASSEM. (034G)	1.20

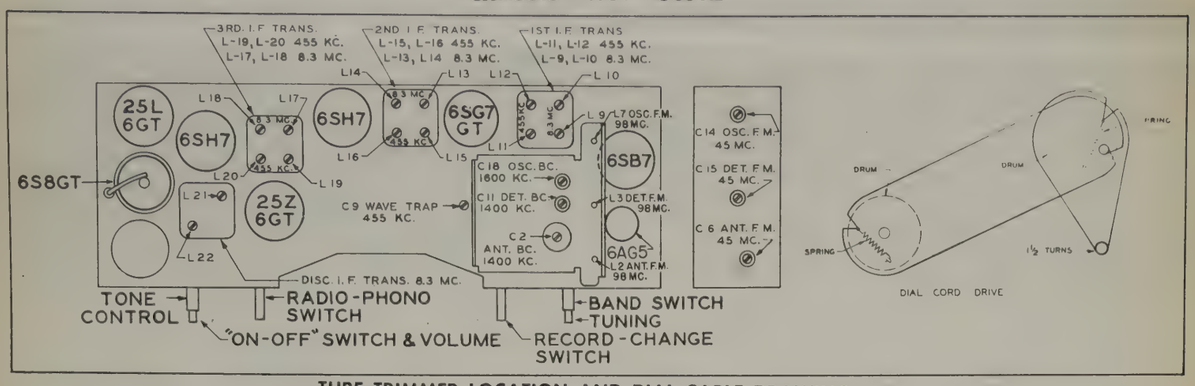
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

15M 2-18-47


ANT
L2 X AT 600 KC. 1.3 X AT 98 MC.
8.5 X AT 600 KC. 10.6 X AT 98 MC.
13 X FROM 600 KC. TO 455 KC. 4 X FROM 98 MC. TO 8.3 MC.
5.5 X AT 455 KC. 57 X AT 8.3 MC.
12 X FROM 455 KC. TO 400 Ω
34 X AT 400 Ω 1 WATT OUTPUT
23 X AT 8.3 MC.
BOTTOM VIEW OF TUBE SOCKETS
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
6AG5 R.F.
6SB7 CONVERTER
6SG7/GT IST. I.F.
6SH7 2ND. I.F.
6SH7 LIMITER
6S8GT DISCRIMINATOR DET. IST. AUDIO
25L6 GT PWR. AMP.
2ND. I.F. TRANS. 8.3 MC.
3RD. I.F. TRANS. 8.3 MC.
DISC. I.F. TRANS. 8.3 MC. T4
IST. I.F. TRANS. 8.3 MC.
F.M. DET. COIL
F.M. OSC. C.
F.M. ANT. COIL
BC. DET. COIL
BC. OSC.
WAVE TRAP COIL
BAND SWITCH S1 SHOWN IN STANDARD BROADCAST POSITION
BAND SWITCH POSITIONS
IST. POS. ST'D. BROADCAST
2ND. POS. F. M. 100 MC.
3RD. POS. F. M. 45 MC.
RIM PAINTED WHITE
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
25Z6GT RECT.
117 V. A.C.
P. L. #47
R. F. CHOKE
SWITCH ON VOL. CONTROL R 13
117 V. A.C.-D.C. 50-60 ∿ 50 WATTS
TO ANTENNA TERMINAL STRIP FM CONNECTION
SPEAKER FIELD 250Ω (HOT)
NORMAL LO
AMP. MOD. I.F. FREQUENCY 455 KC.
FREQ. MOD. I.F. FREQUENCY 8.3 MC.
TUNING RANGES
540-1620 KC. STD. BC.
88-108 MC. F.M. 100
42-48.5 MC. F.M. 45
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

MODELS 8H023 - 8H034
CHASSIS No. 8C01

MODELS 8H023Z - 8H034Z
CHASSIS No. 8C01Z



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 8C01Z chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

When adjustments are made on the 8C01 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 6) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

Part of the audio voltage from the voice coil is fed back to the first audio grid (6S8GT) in phase through resistor R16 and R14 to a tap on the volume control R13. Capacitor C27 bypasses highs to ground. The overall result of this arrangement is to boost the bass tones. One side of the output transformer secondary is grounded. The side grounded determines the phase relationship of the feedback voltage, therefore, when replacing the output transformer be certain the proper end of the secondary is grounded or degeneration will result.

The filter circuits of chassis 8C01Z incorporate new features that should be well understood by the service man. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter capacitor C31 off the cathode of the rectifier 25Z6GT to the 25L6GT plate. The lower connection of the output transformer feeds B + to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 25L6GT produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistors R22 and capacitor C23 and C29.

This development in filtering systems allows a higher effective plate voltage on the 25L6GT for increased power output.

NOTE; The output transformer must be replaced with an exact duplicate, Part No. 206-603 be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 Socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-11,12,15,16, 19 and 20	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	C9	Adjust wavetrap for minimum output
3	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C18	Set oscillator to dial scale
4	2 turns loosely cpld. to wavemagnet	.05 Mfd.	1400 Kc. Modulated	BC	1400 Kc.	C11 & C2	Align det. and ant. stages.
5 (a)	Pin 4 (grid) on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L21 coil slug Primary discr.	Align primary of discrimator for maximum reading
6 (b)	Pin 4 (grid) on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L22 coil slug sec. of disc.	Adjust secondary of discriminator for zero reading
7 (c)	Pin 4 (grid) on 6SH7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L17 & L18 Prim. & Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading
8 (c)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L13 & L14 primary and sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
9 (c)	Pin 8 (grid) on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L9 & L10 Primary & Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
10 (c) (d)	Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil slug	Set oscillator to dial scale
11 (c) (d)	Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 & L2 Det. and RF coil slugs	Align det. and ant. stages to maximum reading
12 (c)	Antenna Post (Remove line ant.)	270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C14	Set oscillator to dial scale
13 (c)	Antenna Post (Remove line ant.)	270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C15 & C6	Align detector & ant. stages for maximum reading.

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

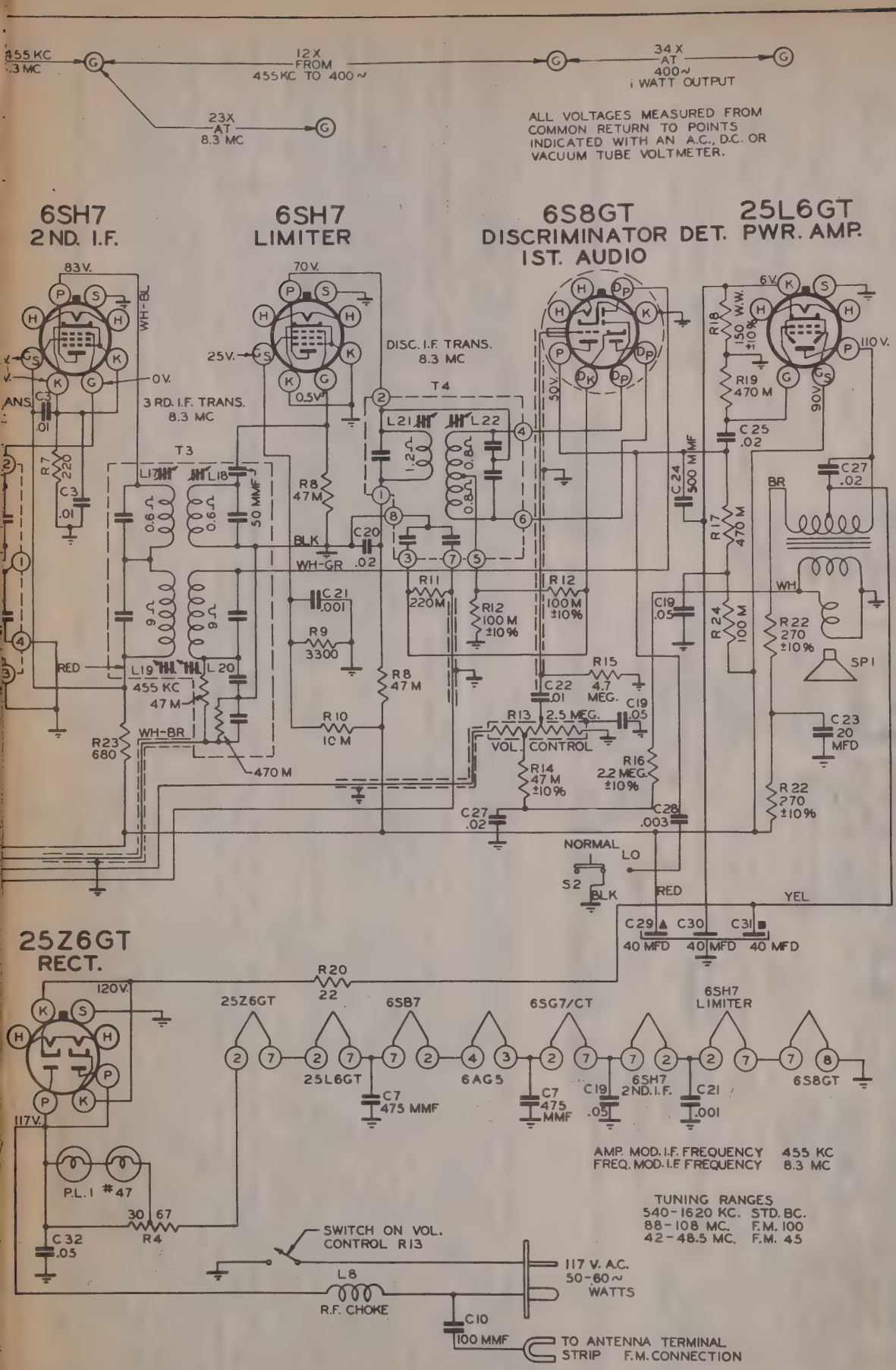
An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)
(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)
(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4) to chassis.
(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

DESCRIPTION	PART NO.	REF. NO.	PRICE
DIAL ASSEMBLY			
Dial Scale	26-326		.50
Tuning control shaft	76-441		.20
Dial light socket & wire	78-600		.80
Dial cord tension spring	80-402		.03
Tuner arm tension spring	80-444		.05
Tuner arm pressure spring	80-445		.10
Dial light bulb	100-67		1.20C
Retaining ring	188-30		1.20C
Retaining ring (used on S-10953)	188-34		.63
Dial mtg. plate & stud assem	S-10945		.40
Pointer & pulley assem. (59-148)	S-10953		.05
Pointer pulley cord & eyelet assem	S-11357		.05
Drive pulley cord & eyelet assem	S-11358		.05
Tone control sw. arm & sleeve assem	S-11810		.90
Tuner arm & spring assem	S-12238		.36
Tuning cond. pulley & cam assem	S-12239		
COILS AND CHOKES			
Wave trap coil assem	S-8926	L5	.28
E. C. detector coil assem	S-13835	L4	.60
E. C. oscillator coil assem	S-11157	L6	.53
1st I. F. transformer assem	S-12249	T1	3.47
2nd I. F. transformer assem	S-13571	T2	3.72
Discriminator transformer assem	S-12252	T4	2.78
A. C. line choke coil assem	S-11256	L8	.35
F. M. antenna coil assem	S-12257	L2	.44
F. M. detector coil assem	S-12258	L3	.45
F. M. oscillator coil assem	S-12259	L7	.33
3rd I. F. transformer assem	S-12468	T3	4.38
CONDENSERS			
100 mmfd	22-162	C10	500 Volt. .20
250 mmfd	22-182	C12	600 Volt. .26
.01 mfd	22-196	C22	600 Volt. .20
.003 mfd	22-288	C28	600 Volt. .20
.05 mfd	22-830	C25	200 Volt. .20
.05 mfd	22-829	C19	600 Volt. .20
.05 mfd	22-1017	C32	600 Volt. .20
.02 mfd	22-1127	C27	400 Volt. .20
500 mmfd	22-1138	C24	600 Volt. .20
Three gang variable	22-1359	C1	5.50
Dry electrolytic - 40 x 40 mfd. 150 V. x 40 mfd. 25 V	22-1366	C29,C30 & C31	1.70
50 mmfd	22-1367	C16	500 Volt. .33
.01 mfd	22-1385	C3	200 Volt. .20
.02 mfd	22-1386	C20	200 Volt. .20
Trimmer (wave trap)	22-1388	C9	2.78
.001 mfd	22-1439	C21	200 Volt. .35
Trimmer (F. M. ant.)	22-1485	C6	.20
Trimmer (F.M. det.)	22-1486	C15	.45
100 mmfd	22-1488	C4	300 Volt. .28
10 mmfd	22-1489	C8	500 Volt. .23
18 mmfd	22-1490	C13	500 Volt. .32
20 mmfd	22-1491	C5	500 Volt. .27
50 mmf. ceramic	22-1513	C17	500 Volt. .28
52 mmf. ceramic	22-1509	C33	500 Volt. .33
.2 mfd	22-1531	C26	200 Volt. .20
Trimmer (F.M. osc)	22-1646	C14	200 Volt. .35
20 mfd. electro	22-1635	C23	150 Volt. 1.00
RESISTORS			
220 M	63-296	R11	1/4 Watt. .09
100 M ohm	63-445	R12	1/4 Watt. .09
220 ohm	63-579	R7	1/4 Watt. .19
680 ohm	63-582	R2	1/4 Watt. .09
1000 ohm	63-583	R22	1/4 Watt. .09
3300 ohm	63-586	R9	1/4 Watt. .09
47M ohm	63-593	R8	1/4 Watt. .09
470M ohm	63-597	R17	1/4 Watt. .09



MODELS 8H023Z - 8H034Z
CHASSIS 8C01Z

PARTS LIST

MODELS 8H032 - 8H050 - 8H050R - 8H051E - 8H052R
8H061 - 8H061G (Chassis 8C20)

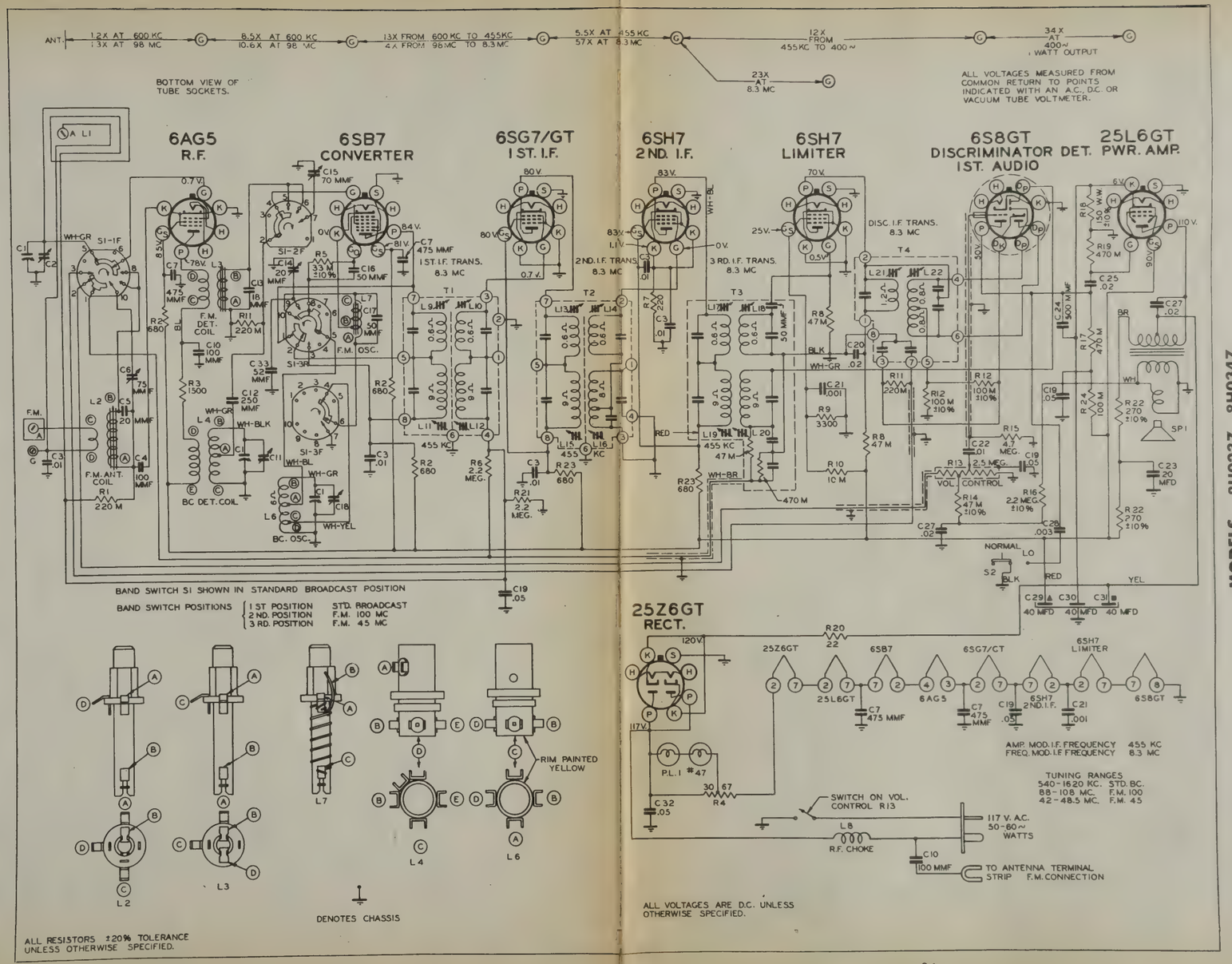
MODELS 8H032 - 8H033 - 8H050 - 8H051 - 8H052 - 8H061
CHASSIS No. 8C20

1ST I.F. TRANS. L-14, L-15 455 KC.

PART NO.		PRICE
	DIAL ASSEMBLY	
26-361	Dial Scale	.40
59-171	Dial Pointer	.30
76-441	Tuning Control Shaft	.20
78-699	Dial Light Socket & Wire	.60
80-402	Dial Cord Tension Spring	.03
80-444	Tuner Arm Tension Spring	.05
80-445	Tuner Arm Pressure Spring	.10
100-36	Dial Light Bulb	.10
149-54	F.M. Tuning Iron Core & Spring (3 used)	.60
188-30	Retaining Ring	1.20C
188-34	Retaining Ring	1.20C
S11292	Pointer Pulley & Bushing Assem.	.16
S11357	Pointer Pulley Cord & Eyelet Assem.	.05
S11358	Drive Pulley Cord & Eyelet Assem.	.05
S12238	Tuner Arm Assem.	.90
S12239	Condenser Pulley & Cam Assem.	.36
S12260	Dial Plate & Stud Assem.	.89
	COILS & CHOKES	
S12253	Wave Trap Coil Assem. (L5)	.28
S11156	B. C. Detector Coil Assem. (L4)	.47
S11291	B. C. Oscillator Coil Assem. (L6)	.50
S12249	1st I.F. Transformer Assem. (T1)	3.47
S12250	2nd I.F. Transformer Assem. (T2)	3.72
S12251	3rd I.F. Transformer Assem. (T3)	3.00
S12252	Discriminator Transformer Assem. (T4)	2.78
S12256	A.C. Line Choke Assem. (L8)	.35
S12257	F.M. Antenna Coil Assem. (L2)	.44
S12258	F.M. Detector Coil Assem. (L3)	.45
S12259	F.M. Oscillator Coil Assem. (L7)	.33
S12389	Antenna Loading Coil Assem. (L9)	.25
	CONDENSERS	
22-162	.0001 Mfd. (C22) 600 V.	.20
22-182	250 Mmfd. (C24) 600 V.	.26
22-188	.02 Mfd. (C34) 400 V.	.20
22-196	.01 Mfd. (C33) 600 V.	.20
22-288	.003 Mfd. (C16) 600 V.	.20
22-448	.004 Mfd. (C18) 600 V.	.20
22-470	.00015 Mfd. (C12) 600 V.	.20
22-827	.1 Mfd. (C17) 200 V.	.23
22-829	.05 Mfd. (C3) 200 V.	.20
22-830	.02 Mfd. (C13) 600 V.	.20
22-912	.002 Mfd. (C36) 600 V.	.20
22-1041	.005 Mfd. (C23) 400 V.	.20
22-1135	.005 Mfd. (C35) 600 V.	.20
22-1137	150 Mmfd. (C32) 600 V.	.20
22-1138	500 Mmfd. (C14) 600 V.	.20
22-1367	50 Mmfd. (C10) 500 V.	.33
22-1368	Three Gang Variable (C1)	5.00
22-1382	Dry Electrolytic - 40 x 40 Mfd. 450 V. (C19, 20 & 21) 40 Mfd. 25 V.	3.25
22-1385	.01 Mfd. (C31) 200 V.	.20
22-1388	Trimmer (85 Mmfd.) (C7)	.35
22-1431	.001 Mfd. (C8) 600 V.	.20
22-1445	.002 Mfd. (C15) 600 V. (Metal Clad)	.87
22-1485	Trimmer (90 Mmfd.) (C5)	.45
22-1486	Trimmer (70 Mmfd.) (C30)	.45
22-1488	100 Mmfd. (C26) 300 V.	.28
22-1489	10 Mmfd. (Ceramic) (C27)	.23
22-1490	18 Mmfd. (Ceramic) (C28)	.32
22-1491	20 Mmfd. (Ceramic) (C25)	.27
22-1492	50 Mmfd. (Ceramic) (C11)	.27
22-1509	52 Mmf Ceramic (C37)	.33
22-1646	20 Mmfd. Trimmer (C29)	
	RESISTORS	
63-160	100 M ohm (R1) 1/4 watt	.10
63-246	150 ohm (R15) 1/4 watt	.09
63-296	220 M ohm (R10) 1/4 watt	.09
63-445	100 M ohm (R21) 1/4 watt insl.	.19
63-593	47M ohm (R9) 1/4 watt	.09
63-595	100 M ohm (R13) 1/4 watt	.09
63-597	470 M ohm (R3) 1/4 watt	.09
63-639	6800 ohm (R2) 1/4 watt	.09
63-648	47 M ohm. (R19) 1/4 watt	
63-712	33 M ohm (R7) 1/4 watt	
63-717	220 M ohm (R12) 1/4 watt insl.	.19
63-722	2.2 megohm (R6) 1/4 watt insl.	.19
63-767	47M ohm (R8) 1/4 watt insl.	.19
63-803	2200 ohm (R5) 1/2 watt	.10
63-976	15 megohm (R14) 1/4 watt	.09
63-1058	22 M ohm (R4) 2 watt	.24
63-1099	33 ohm w.w. (R17) 1/2 watt insl.	.24
63-1172	100 ohm w.w. (R20) 1/2 watt insl.	.24
63-1222	470 ohm w.w. (R18) 1 watt insl.	.24
63-1225	68 M ohm w.w. (R11) 1/2 watt insl.	.21
63-1466	Volume Control & Switch (R16)	1.81
	MISCELLANEOUS	
2-114	Cabinet Back (032)	.50
11-87	Line Cord & Plug (8 ft.)	.65
11-97	Line Cord & Plug (10 ft.)	.95
27-87	Silver Mica Disc (475 Mmfd.) (3 used) (C4)	.04
46-522	Control Knob (Dummy)	.11
46-538	Tuning Control Knob	.10

PART NO.	REF. NO.	DESCRIPTION	PRICE
		RESISTORS - Continued	
63-600	R21	2.2 megohm. . . . . 1/4 Watt.	.09
63-602	R15	4.7 megohm. . . . . 1/4 Watt.	.09
63-639	R3	6800 ohm. . . . . 1/4 Watt.	.09
63-666	R16	2.2 megohm. . . . . 1/4 Watt.	.09
63-702	R23	680 ohm . . . . . 1/4 Watt.	.19
63-175	R24	100M ohms . . . . . 1/4 Watt.	.19
63-717	R1	220M ohm. . . . . Insl . 1/4 Watt.	.19
63-719	R19	470M ohm. . . . . Insl. 1/4 Watt.	.19
63-722	R6	2.2 megohm. . . . . Insl. 1/4 Watt.	.19
63-765	R5	33M ohm . . . . . Insl. 1/4 Watt.	.19
63-767	R14	47M ohm . . . . . Insl. 1/4 Watt.	.19
63-1203	R22	270 ohm wirewound resistor. . . . . 1 Watt.	.24
63-1216	R10	10M ohm . . . . . Insl . 1 Watt.	.24
63-1237	R18	150 ohm W. W. . . . . Insl. 1/2 Watt.	.21
63-1336	R13	Volume control & switch	1.81
63-1339	R4	Two section candohm (or 63-1464).	.84
63-1450	R20	22 ohm W. W. . . . . Insl. . 1Watt.	.24
		MISCELLANEOUS	
11-85		A. C. line cord and plug.	.65
14-923		Model 023 bakelite cabinet (walnut)	6.60
14-923W		Model 023W bakelite cabinet (white)	8.00
14-923Y		Model 023Y bakelite cabinet (black)	8.00
19-139		Cabinet back retaining clip (4 used).	.03
27-87	C7	Silver mica aisc (475 mmfd.).	.03
46-521		Tuning & tone control knob (2 used)	.12
46-538		Tuning & tone control knob (2 used) (034 & 034G).	.10
49-603		5" P. M. speaker.	7.75
		206-603 output transformer.	1.97
		208-603 cone & voice coil	1.73
57-1054		Spark plate.	.10
57-1063		Escutcheon plate (034 & 034G)	5.70
58-128		Two prong A. C. male plug	.15
78-194		Socket - two contact (used on cabinet backs).	.12
78-439		Socket - miniature tube	.12
78-611		Socket - octal tube (8 contact)	.12
80-372		Tube retaining spring	.10
83-1128		Insulating strip (tone con. sw.).	.02
85-365		Tone control sw	.30
93-93		Bakelite washer (used on vol. control)...	.01
93-94		Bakelite shoulder washer (used on vol. con.).	.01
94-485		Insulating bushing (used on vol. con.).	.03
97-217		Insulating chassis mtg. stud (4 used)	.17
112-540		Chassis mtg. screw (4 used)	.02
114-196		Chassis mtg. screw (4 used) (034 & 034G).	.05
126-379		Tube shield (for 6SG7GT).	.07
126-382		Tube shield	.08
139-58		Baffle board (034 & 034G)	.40
149-54		Tuning core & spring (3 used)	.60
188-48		Control knob decorative ring (used on S11558)	.04
188-54		Tuning knob clamping ring	.02
188-102		Tone con. clamping ring	.02
192-81		Dial crystal (023 & 023Y)	2.27
192-91		Dial crystal (034 & 034G)	.64
192-106		Dial crystal (023W)	2.27
196-76		Dial crystal gasket (034)	.10
196-82		Dial crystal gasket (034G).	.10
202-383		Instruction book.	.10
S-11135	L1	Wavemagnet assem. (#29)	.75
S-11558		Volume control knob & ring assem. (46-520).	.28
S-11619		Cabinet back socket & A. C. cord assem. (034 & 034G).	2.30
S-11622		Cabinet back socket & A. C. cord assem. (023 & 023Y).	2.15
S-11808		Cabinet back socket & A. C. cord assem. (023W).	2.45
S-12305		Pand sw. knob & ring assem. (46-598).	.32
S-12490		Pand sw. & spark plate assem. (85-384).	4.27
S-12687		Grille cloth & screen assem. (034).	1.20
S-13122		Grille cloth & screen assem. (034G)	1.20

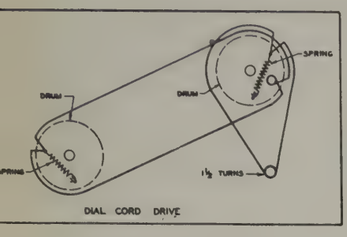
Prices subject to change without notice 25M 5-1-47


ANT.
1.2X AT 600 KC
1.3X AT 98 MC
8.5X AT 600 KC
10.6X AT 98 MC
13X FROM 600 KC TO 455KC
4X FROM 98MC TO 8.3MC
5.5X AT 455 KC
57X AT 8.3 MC
12X FROM 455KC TO 400~
34X AT 400~
1 WATT OUTPUT
23X AT 8.3 MC
BOTTOM VIEW OF TUBE SOCKETS.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
6AG5 R.F.
6SB7 CONVERTER
6SG7/GT 1ST. I.F.
6SH7 2ND. I.F.
6SH7 LIMITER
6S8GT DISCRIMINATOR DET. 1ST. AUDIO
25L6GT PWR. AMP.
1ST. I.F. TRANS. 8.3 MC
2ND. I.F. TRANS. 8.3 MC
3 RD. I.F. TRANS. 8.3 MC
DISC. I.F. TRANS. 8.3 MC
F.M. DET. COIL
F.M. OSC.
F.M. ANT. COIL
BC DET. COIL
BC. OSC.
VOL. CONTROL
NORMAL
LO
BAND SWITCH S1 SHOWN IN STANDARD BROADCAST POSITION
BAND SWITCH POSITIONS
1 ST POSITION STD. BROADCAST
2 ND. POSITION F.M. 100 MC
3 RD. POSITION F.M. 45 MC
RIM PAINTED YELLOW
DENOTES CHASSIS
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
25Z6GT RECT.
AMP. MOD. I.F. FREQUENCY 455 KC
FREQ. MOD. I.F. FREQUENCY 8.3 MC
TUNING RANGES
540-1620 KC. STD. BC.
88-108 MC. F.M. 100
42-48.5 MC. F.M. 45
SWITCH ON VOL. CONTROL R13
117 V. A.C. 50-60~ WATTS
R.F. CHOKE
TO ANTENNA TERMINAL STRIP F.M. CONNECTION
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

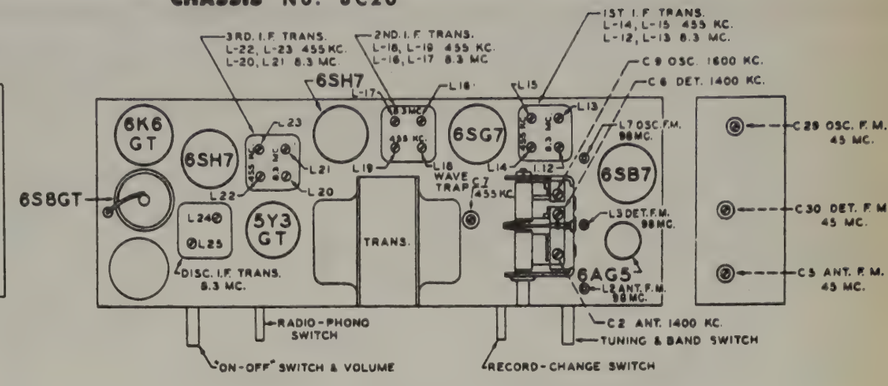
MODELS 8H023Z - 8H034Z
CHASSIS 8C01Z

MODELS 8H032 – 8H033 – 8H050 – 8H051 – 8H052 – 8H061

CHASSIS No. 8C20



DIAL CABLE DRAWING



TUBE TRIMMER LOCATION

TO THE SERVICE MAN:

The 8C21 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'S. Observe the same precautions when making adjustments. The second 8.3 Mc IF stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides a satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. THE LOAD RESISTOR MUST BE REMOVED AFTER ALIGNMENT.

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 6) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-14, 15, 18, 19, 22 and 23	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	C7	Adjust wavetrap for minimum output
3	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C9	Set oscillator to dial scale
4	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2 & C6	Align det. and ant. stages
5(a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L-24 coil slug primary discriminator	Align primary of discriminator for maximum reading
6(b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L-25 coil slug sec. of discriminator	Adjust secondary of discriminator for zero reading
7(c)	Pin 4 (grid) on 6SH7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L20 & L21 Prim. & Sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
8(c)(d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L16 & L17 Primary & Sec. of 2nd IF transformer	Align2nd IF transformer for maximum reading
9(c)(d)	Pin 8 grid on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L12 & L13 Primary & Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
10(c)	Antenna Post (Remove line ant.)	270 Ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Oscillator coil slug	Set oscillator to dial scale
11(c)	Antenna Post (Remove line ant.)	270 Ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L2 and L3 Det. and RF coil slugs	Align det. and ant. stages to maximum reading
12(c)	Antenna Post (Remove line ant.)	270 Ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C29	Set oscillator to dial scale
13(c)	Antenna Post (Remove line ant.)	270 Ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C5 and C30	Align detector & ant. stages for maximum reading

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resister of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments. The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)
(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)
(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4) to chassis.
(d) 300 ohm ½ watt carbon resistor soldered across the secondary L17 (pin 2 and 3 of 2nd, IF transformer. The leads to the resistor must be as short as possible and the resistor removed before operation 10 is started.

PARTS LIST

MODELS 8H032 – 8H050 – 8H052 – 8H051E – 8H052R
8H061 – 8H061G (Chassis 8C20)

PART NO.	DIAL ASSEMBLY	PRICE
26-361	DIAL SCALE	.40
59-171	DIAL POINTER	.30
76-441	TUNING CONTROL SHAFT	.20
78-699	DIAL LIGHT SOCKET & WIRE	.60
80-402	DIAL CORD TENSION SPRING	.03
80-444	TUNER ARM TENSION SPRING	.05
80-445	TUNER ARM PRESSURE SPRING	.10
100-36	DIAL LIGHT BULB	.10
149-54	F. M. TUNING IRON CORE & SPRING (3 USED)	.60
188-30	RETAINING RING	1.20C
188-34	RETAINING RING	1.20C
S11292	POINTER PULLEY & BUSHING ASSEM.	.16
S11357	POINTER PULLEY CORD & EYELET ASSEM.	.05
S11358	DRIVE PULLEY CORD & EYELET ASSEM.	.05
S12238	TUNER ARM ASSEM.	.90
S12239	CONDENSER PULLEY & CAM ASSEM.	.36
S12260	DIAL PLATE & STUD ASSEM.	.89

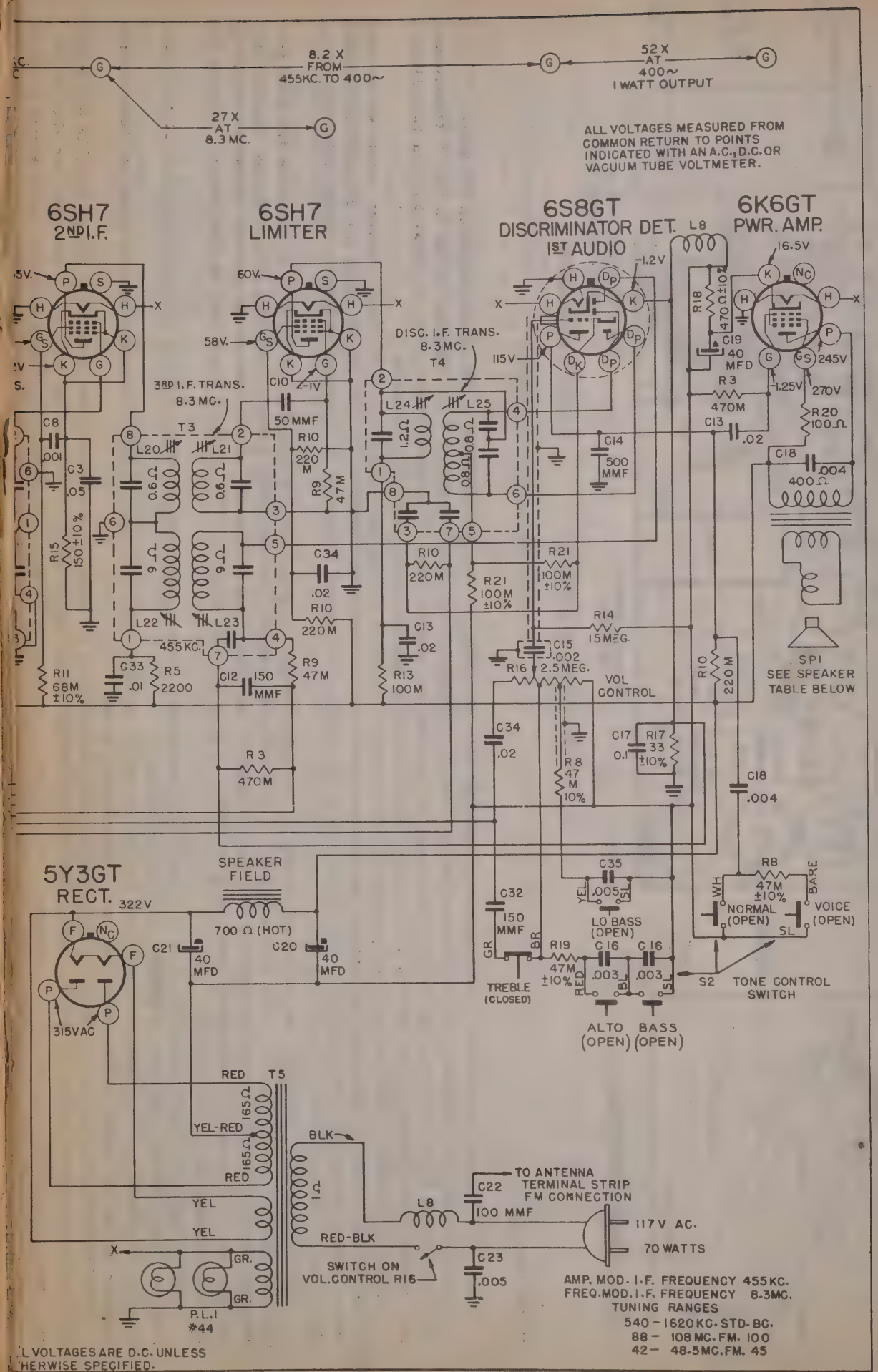
PART NO.	COILS & CHOKES	PRICE
S12253	WAVE TRAP COIL ASSEM. (L5)	.28
S11156	B. C. DETECTOR COIL ASSEM. (L4)	.47
S11291	B. C. OSCILLATOR COIL ASSEM. (L6)	.50
S12249	1ST I.F. TRANSFORMER ASSEM. (T1)	3.47
S12250	2ND I.F. TRANSFORMER ASSEM. (T2)	3.72
S12251	3RD I.F. TRANSFORMER ASSEM. (T3)	3.00
S12252	DISCRIMINATOR TRANSFORMER ASSEM. (T4)	2.78
S12256	A.C. LINE CHOKE ASSEM. (L8)	.35
S12257	F.M. ANTENNA COIL ASSEM. (L2)	.44
S12258	F.M. DETECTOR COIL ASSEM. (L3)	.45
S12259	F.M. OSCILLATOR COIL ASSEM. (L7)	.33
S12369	ANTENNA LOADING COIL ASSEM. (L9)	.25

PART NO.	CONDENSERS	PRICE
22-162	.0001 Mfd. (C22) ..... 600 V.	.20
22-182	250 MMFD. (C24) ..... 600 V.	.25
22-186	.02 Mfd. (C34) ..... 400 V.	.20
22-196	.01 Mfd. (C33) ..... 600 V.	.20
22-288	.003 Mfd. (C16) ..... 600 V.	.20
22-448	.004 Mfd. (C18) ..... 600 V.	.20
22-470	.00015 Mfd. (C12) ..... 600 V.	.20
22-627	.1 Mfd. (C17) ..... 200 V.	.23
22-629	.05 Mfd. (C3) ..... 200 V.	.20
22-830	.02 Mfd. (C13) ..... 600 V.	.20
22-912	.002 Mfd. (C36) ..... 600 V.	.20
22-1041	.005 Mfd. (C23) ..... 400 V.	.20
22-1135	.005 Mfd. (C35) ..... 600 V.	.20
22-1137	150 MMFD. (C32) ..... 600 V.	.20

PART NO.	RESISTORS	PRICE
63-160	100 M OHM (R1) ..... 1/4 WATT	.10
63-246	150 OHM (R15) ..... 1/4 WATT	.09
63-296	220 M OHM (R10) ..... 1/4 WATT	.09
63-445	100 M OHM (R21) ..... 1/4 WATT INSL.	.19
63-593	47M OHM (R9) ..... 1/4 WATT	.09
63-595	100 M OHM (R13) ..... 1/4 WATT	.09
63-597	470 M OHM (R3) ..... 1/4 WATT	.09
63-639	6800 OHM (R2) ..... 1/4 WATT	.09
63-648	47 M OHM. (R19) ..... 1/4 WATT	.09
63-712	33 M OHM (R7) ..... 1/4 WATT	.24
63-717	220 M OHM (R12) ..... 1/4 WATT INSL.	.19
63-722	2.2 MEGOHM (R6) ..... 1/4 WATT INSL.	.19
63-767	47M OHM (R8) ..... 1/4 WATT INSL.	.19
63-803	2200 OHM (R5) ..... 1/2 WATT	.10
63-976	15 MEGOHM (R14) ..... 1/4 WATT	.09
63-1058	22 M OHM (R4) ..... 2 WATT	.24
63-1099	33 OHM W.W. (R17) ..1/2 WATT INSL.	.24
63-1172	100 OHM W.W. (R20) .1/2 WATT INSL.	.24
63-1222	470 OHM W.W. (R18) ..1 WATT INSL.	.24
63-1225	68 M OHM W.W. (R11) 1/2 WATT INSL.	.21
63-1466	VOLUME CONTROL & SWITCH (R16) ...	1.81

PART NO.	MISCELLANEOUS	PRICE
2-114	CABINET BACK (032)	.50
11-87	LINE CORD & PLUG (8 FT.)	.65
11-97	LINE CORD & PLUG (10 FT.)	.95
27-87	SILVER MICA DISC (475 MMFD.) (3 USED) (C4)	.04
46-522	CONTROL KNOB (DUMMY)	.11
46-538	TUNING CONTROL KNOB	.10

PART NO.	DIAL LAMPS	PRICE
22-1138	500 MMFD. (C14) ..... 600 V.	.20
22-1367	50 MMFD. (C10) ..... 500 V.	.33
22-1368	THREE GANG VARIABLE (C1)	5.00
22-1382	DRY ELECTROLYTIC – 40 X 40 MFD. 450 V. (C19, 20 & 21) 40 MFD. 25 V.	3.25
22-1385	.01 MFD. (C31) ..... 200 V.	.20
22-1386	TRIMMER (85 MMFD.) (C7)	.35
22-1431	.001 MFD. (C8) ..... 600 V.	.20
22-1445	.002 MFD. (C15) ..... 600 V. (METAL CLAD)	.87
22-1485	TRIMMER (90 MMFD.) (C5)	.45
22-1486	TRIMMER (70 MMFD.) (C30)	.45
22-1488	100 MMFD. (C26) ..... 300 V.	.28
22-1489	10 MMFD. (CERAMIC) (C27)	.23
22-1490	18 MMFD. (CERAMIC) (C28)	.32
22-1491	20 MMFD. (CERAMIC) (C25)	.32
22-1492	50 MMFD. (CERAMIC) (C11)	.27
22-1509	52 MMF CERAMIC (C37)	.33
22-1646	20 MMFD. TRIMMER (C29)	


8.2 X FROM 455KC. TO 400~
52 X AT 400~ 1 WATT OUTPUT
27 X AT 8.3 MC.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
6SH7 2ND I.F.
6SH7 LIMITER
6S8GT DISCRIMINATOR DET. 1ST AUDIO
6K6GT PWR. AMP.
DISC. I.F. TRANS. 8.3MC. T4
3RD I.F. TRANS. 8.3MC. T3
455 KC.
VOL CONTROL
SPI SEE SPEAKER TABLE BELOW
5Y3GT RECT.
SPEAKER FIELD
700 Ω (HOT)
315VAC
LO BASS (OPEN)
TREBLE (CLOSED)
ALTO (OPEN)
BASS (OPEN)
NORMAL (OPEN)
VOICE (OPEN)
S2 TONE CONTROL SWITCH
T5
TO ANTENNA TERMINAL STRIP FM CONNECTION
117 V AC.
70 WATTS
SWITCH ON VOL. CONTROL R16
P.L.1 #44
AMP. MOD. I.F. FREQUENCY 455 KC.
FREQ. MOD. I.F. FREQUENCY 8.3 MC.
TUNING RANGES
540 – 1620 KC. STD. BC.
88 – 108 MC. FM. 100
42 – 48.5 MC. FM. 45
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

MODELS 8H032 – 8H033 – 8H050 – 8H051 – 8H052 – 8H061
CHASSIS No. 8C20

PARTS LIST

MODELS 9H079-079E-079R-081-082E-082R-085R-088R

PART NO.	DIAL ASSEMBLY	PRICE
26-361	DIAL SCALE	.40
59-171	DIAL POINTER	.30
76-441	TUNING CONTROL SHAFT	.20
78-699	DIAL LIGHT SOCKET & WIRE	.60
80-402	DIAL CORD TENSION SPRING	.03
80-444	TUNER ARM TENSION SPRING	.05
80-445	TUNER ARM PRESSURE SPRING	.10
100-36	DIAL LIGHT BULB	.10
149-54	F.M. TUNING IRON CORE & SPRING (3 USED)	.60
159-50	DIAL SCALE SNAP BUTTON	.01
188-30	RETAINING RING	1.20C
188-34	RETAINING RING	1.20C
S11292	POINTER PULLEY & BUSHING ASSEM.	.16
S11357	POINTER PULLEY CORD & EYELET ASSEM.	.05
S11358	DRIVE PULLEY CORD & EYELET ASSEM.	.05
S12238	TUNER ARM ASSEM.	.90
S12239	PULLEY & CAM ASSEM (ON GANG)	.36

COILS & CHOKES

S8326	WAVE TRAP COIL ASSEM. PART OF S-12253	.28
S11156	B.C. DETECTOR COIL ASSEM. (L4)	.47
S11291	B.C. OSCILLATOR COIL ASSEM. (L6)	.50
S12249	1ST I.F. TRANSFORMER ASSEM. (T1)	3.47
S12251	3RD I.F. TRANSFORMER ASSEM. (T3)	3.00
S12252	DISCRIMINATOR TRANSFORMER ASSEM. (T4)	2.78
S12253	WAVE TRAP COIL & TRIMMER ASSEM. (L5)	1.69
S12256	A.C. LINE CHOKE ASSEM. (L8)	.35
S12257	F.M. ANTENNA COIL ASSEM. (L2)	.44
S12258	F.M. DETECTOR COIL ASSEM. (L3)	.45
S12259	F.M. OSCILLATOR COIL ASSEM. (L7)	.33
S12529	ANTENNA LOADING COIL ASSEM. (L9)	.48
S13571	2ND I.F. TRANSFORMER ASSEM. (T2)	

CONDENSERS

22-162	.0001 MFD. (C22) 600 V.	.20
22-182	250 MMFD. (C24) 600 V.	.26
22-188	.02 MFD. (C35) 400 V.	.20
22-196	.01 MFD. (C33) 600 V.	.20
22-288	.003 MFD. (C16) 600 V.	
22-365	100 MMFD. 600 V.	.26
22-448	.004 MFD. (C18) 600 V.	.20
22-470	.00015 MFD. (C12) 600 V.	.20
22-827	.1 MFD. (C17) 200 V.	.23
22-829	.05 MFD. (C3) 200 V.	.20
22-830	.02 MFD. (C13) 600 V.	.20
22-912	.002 MFD. (C34) 600 V.	.20
22-1041	.005 MFD. (C23) 400 V.	.20
22-1135	.005MFD. (C36) 600 V.	.20
22-1137	150 MMFD. (C32) 600 V.	.20
22-1138	.0005 MFD. (C14) 600 V.	.20
22-1367	50 MMFD. (C10) 500 V.	.33
22-1368	THREE GANG VARIABLE (C1)	5.00
22-1382	DRY ELECTROLYTIC 40 X 40 MFD. (C19.C20.C21) 450 V. X. 40 MFD 25 V.	3.25
22-1385	.01 MFD. (C31) 200 V.	.20
22-1388	TRIMMER (85 MMFD.)	.35
22-1431	.001 MFD. (C8) 600 V.	.20
22-1445	.002 MFD. (C15) 600 V. (METAL CLAD)	.87
22-1485	TRIMMER (90 MMFD.) (C5)	.45
22-1486	TRIMMER (70 MMFD.) (C30)	.30
22-1487	TRIMMER (55 MMFD.) (OR 22-1571)	.41
22-1488	100 MMFD. (C26) 300 V.	.28
22-1489	10 MMFD. CERAMIC (C27)	.23
22-1490	18 MMFD. CERAMIC (C28)	.32
22-1491	20 MMFD. CERAMIC (C25)	.27
22-1492	50 MMFD. CERAMIC (C11)	.27
22-1509	52 MMFD. CERAMIC (C38)	
22-1646	20 MMFD. TRIMMER (C29)	

RESISTORS

63-160	100M OHM (R1) 1/2 WATT	.10
63-246	150 OHM (R15) 1/4 WATT	.09
63-445	100M OHM (R21)	
63-296	220M OHM (R10)	
63-593	47M OHM (R9) 1/4 WATT	.09
63-595	100M OHM (R13) 1/4 WATT	.09
63-597	470M OHM (R3) 1/4 WATT	.09
63-600	2.2 MEGOHM 1/4 WATT	.09
63-639	6800 OHM (R2) 1/4 WATT	.09
63-648	47M OHM (R19) 1/4 WATT	.09
63-712	33M OHM (R7) INSL. 1/4 WATT	.19
63-717	220M OHM INSL. 1/4 WATT	.19
63-722	47M OHM (R8) INSL. 1/4 WATT	
63-767	2.2 MEGOHM (R6) 1/4 WATT	
63-769	68M OHM INSL. 1/4 WATT	.19
63-772	150M OHM INSL. 1/4 WATT	.19
63-778	470M OHM INSL. 1/4 WATT	.19
63-803	2200 OHM (R5) 1/2 WATT	
63-976	15 MEGOHM (R14) 1/4 WATT	.09
63-1058	22M OHM (R4) 2 WATT	.24
63-1099	33 OHM (R17) W.W. 1/2 WATT	.21
63-1163	2200 OHM (R22) INSL. 1/2 WATT	.21
63-1189	200 OHM (R23) W.W. 2 WATT	
63-1172	100 OHM (R20) W.W. INSL 1/2 WATT	
63-1222	470 OHM (R18) W.W. INSL 1 WATT	.24
63-1225	68M OHM (R11) W.W. INSL 1/2 WATT	.21
63-1466	VOL. CONTROL & SW. 2.5 MEG (R16)	1.81
63-1529	1500 OHM (R24) 5 WATT	

MISCELLANEOUS

11-97	LINE CORD & PLUG (10 FT.)	.95
27-87	SILVER MICA DISC (475 MMFD.) (C4)	.03
57-1054	SPARK PLATE	.10
78-128	SOCKET - SPEAKER PLUG	.12
78-274	SOCKET - ELECTROLYTIC	.03
78-349	SOCKET - WAVEMAGNET PLUG	.07
78-439	SOCKET - MINIATURE TUBE	.12
78-582	SOCKET - PHONO PLUG (9 CONTACT)	.20
78-611	SOCKET - OCTAL (8 CONTACT)	.12
80-372	TUBE RETAINING SPRING	.10
85-349	REJECT SWITCH	.60
85-363	PHONO-RADIO SWITCH	.72
95-922	POWER TRANSFORMER - 117 V. 50-60 CYCLE	6.90
126-382	TUBE SHIELD	.08
149-54	F.M. TUNING IRON CORE & SPRING (3 USED)	.60
S12265	PHONO CABLE ASSEM.	1.60
S12335	BAND SW. & SPARK PLATE ASSEM. (85-378)	5.23
S12373	BRKT., LOOP SOCKET & ANT. STRIP ASSEM.	.33

RADIORGAN ESCUTCHEON PARTS

57-1138	RADIORGAN ESCUTCHEON (2 USED)	.42
76-444	RADIORGAN KNOB RETAINING PIN	.04
80-447	RADIORGAN RETAINING SPRING	.05
S9595	RADIORGAN STRIP & CONTACT ASSEM.	.31
S12267	RADIORGAN BRKT. ASSEM.	.72
S12283	RADIORGAN KNOB & EYELET ASSEM. (LO-BASS)	.16
S12284	RADIORGAN KNOB & EYELET ASSEM. (BASS)	.16
S12285	RADIORGAN KNOB & EYELET ASSEM. (ALTO)	.16
S12286	RADIORGAN KNOB & EYELET ASSEM. (TREBLE)	.16
S12287	RADIORGAN KNOB & EYELET ASSEM. (VOICE)	.16
S12288	RADIORGAN KNOB & EYELET ASSEM. (NORMAL)	.16
S12289	RADIORGAN ESC. & KNOB ASSEM. COMPLETE. (LO-BASS, BASS, ALTO)	1.79
S12290	RADIORGAN ESC. & KNOB ASSEM. COMPLETE (TREBLE, VOICE, NORMAL)	1.79

MODEL 9H079-079E-079R (Chassis 8C21)

15-64	PLUG CAP & INSULATOR (USED ON S12606)	.06
15-65	PLUG CAP & INSULATOR (USED ON S12606)	.27
15-67	PLUG CAP & INSULATOR (USED ON S12606)	.08
19-123	PHONO UNIT MTG. CLIP (4 USED)	.10
27-81	SHAFT BEARING DISC	.05
36-31	RECORD CHANGER PULL-OUT HANDLE	.57
46-522	CONTROL KNOB (DUMMY)	.11
46-538	TUNING CONTROL KNOB	.10
46-548	RADIO-PHONO REJECT KNOB(2 USED)	.07
*49-534	10" DYNAMIC SPEAKER (SUB 49-536 OR 567)	11.00
	206-534 OUTPUT TRANSFORMER	2.57
	207-534 FIELD COIL (NOT REPLACEABLE)	---
	208-534 CONE & VOICE COIL	3.41
52-377	SPEAKER CABLE FOR 49-567	.60
57-1134	DIAL ESCUTCHEON	5.80
58-88	THREE PRONG WAVEMAGNET PLUG	.07
58-133	NINE PRONG PLUG (USED ON S12606)	.12
70-83	#6 X 1/2 R.H. WASHER TYPE WOOD SCREW. (CAB. BACK MTG.)	.55C
72-59	#2 X 1/2 FLAT PHILLIPS HD. WOOD SCREW (ESC. MTG.)	.02
78-582	NINE PRONG SOCKET (USED ON S12606)	.20
80-463	PHONO UNIT MTG. SPRING (4 USED)	.03
83-1150	RUBBER TRIM STRIP	.84
112-420	1/4-28 SPECIAL OVAL HD. M.S. (PHONO UNIT MTG.)	.33
112-489	HANDLE MTG. SCREW (36-31)	.03
114-148	CHASSIS MTG. SCREW (4 USED)	1.20C
114-233	PHONO SHIPPING SCREW	.07
159-52	PLUG BUTTON (4 USED)	.09
159-53	PLUG BUTTON (4 USED) (079E)	.08
188-48	KNOB DECORATIVE RING	.04
188-54	KNOB CLAMPING RING	.02
192-100	DIAL CRYSTAL	1.75
202-426	PHONO INSTRUCTION BOOK	.12
202-440	INSTRUCTION BOOK	.12
S11454	RECORD CHANGER MTG. FRAME ASSEM.	5.45
S11461	WAVEMAGNET ASSEM. (#30D) (L1)	1.00
S11640	PRE-AMP. ASSEM.	---
S11680	INTER-MIXER RECORD CHANGER ASSEM.	---
S12305	BAND SW. & VOL. CON. KNOB & RING ASSEM. (46-598)	.32
S12606	INTERCONNECTING CABLE ASSEM.	5.47
S12864	PHONO FRAME DRIVE WHEEL & TIRE ASSEM. (2 USED)	.24
	*NOTE: FOR CONVERSION TO P.M. SPEAKER SEE SUPPLEMENTARY LIST.	

MODEL 9H081-085R (Chassis 8C21)

12-1138	WAVEMAGNET MTG. BRKT. (081)	.14
15-64	PLUG CAP & INSULATOR (USED ON S12606)	.06
15-65	PLUG CAP & INSULATOR (USED ON S12606)	.27
15-67	PLUG CAP & INSULATOR (USED ON S12606)	.08
19-123	PHONO UNIT MTG. CLIP (4 USED)	.10
27-81	SHAFT BEARING DISC	.05
36-31	RECORD CHANGER PULL-OUT HANDLE	.57
46-522	CONTROL KNOB (DUMMY)	.11
46-538	TUNING CONTROL KNOB	.10
46-548	RADIO-PHONO REJECT KNOB (2 USED)	.07

MODELS 9H079-079E-079R-081-082E-082R-085R-088R
CHASSIS NO. 8C21

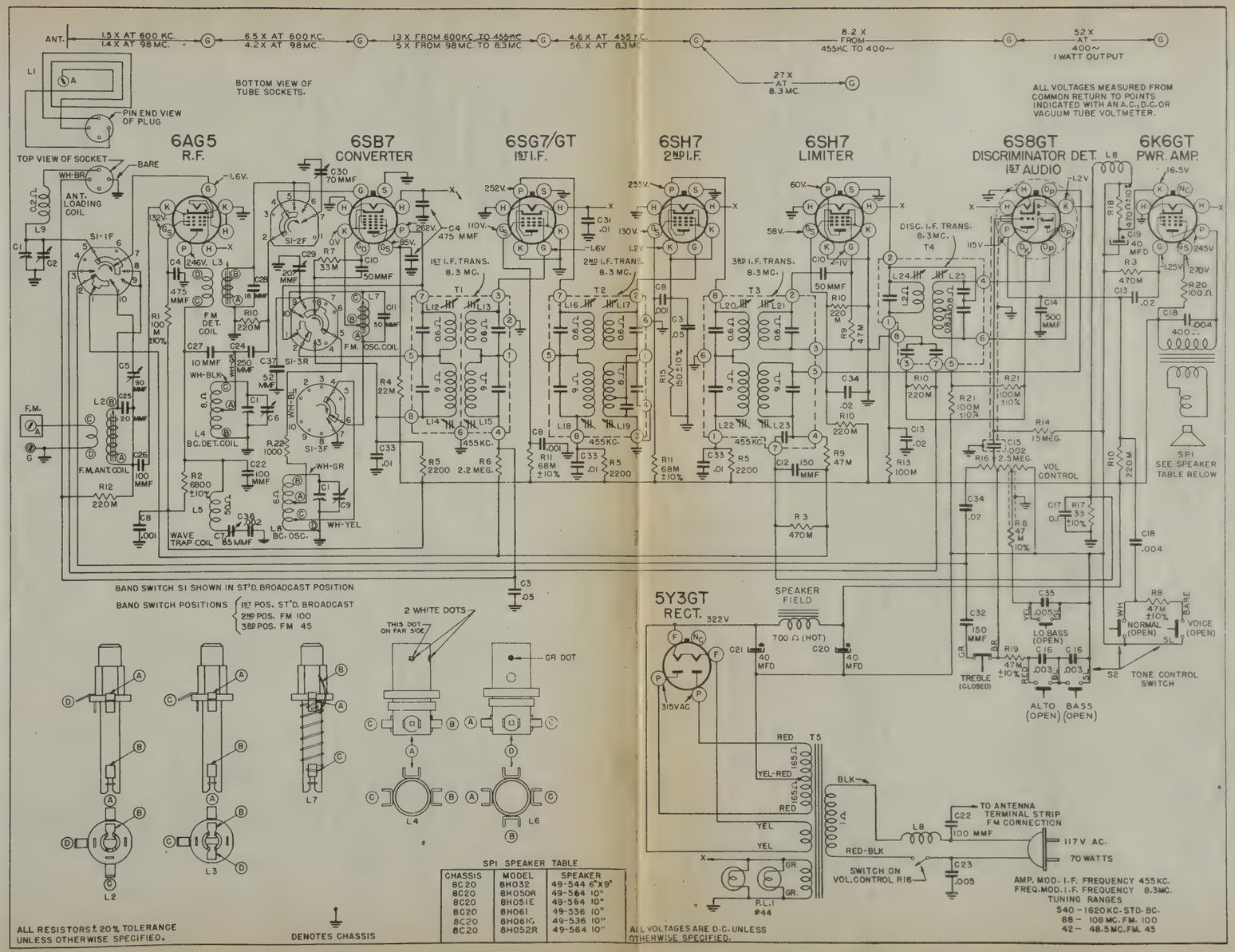
PART NO.		PRICE
49-536	10" Dyn. Speaker (061 & 061G) (or 49-542)	11.00
	206-536 Output Trans.	2.57
	207-536 Field Coil (Not Replaceable)	---
	208-536 Cone & Voice Coil	3.41
49-544	6" x 9" Oval Dyn. Speaker (032).	10.00
	206-544 Output Trans.	2.57
	207-544 Field Coil (Not Replaceable)	---
	208-544 Cone & Voice Coil	2.63
49-564	10" Dyn. Speaker (050-050R-051E-052R)	11.00
	206-564 Output Trans.	2.57
	207-564 Field Coil (Not Replaceable)	---
	208-564 Cone & Voice Coil	3.41
57-1054	Spark Plate (3 used)	.10
57-1072	Dial Escutcheon (050-050R-061-061G)	5.25
57-1135	Dial Escutcheon (032-051E-052R).	5.45
72-65	#2 x 5/8 Flat Hd. Wood Screw (Esc. Mtg.)	.66C
78-128	Socket - Speaker Plug	.12
78-274	Socket - Electrolytic Cond.	.03
78-363	Socket - Wavemagnet Plug	.07
78-439	Socket - Miniature Tube	.12
78-611	Socket - Octal Tube (8 Contact)	.12
80-372	Tube Retaining Spring	.10
85-378	Band Switch (S1)	3.00
93-168	Rubber Shoulder Washer	.07
93-686	Bakelite Shoulder Washer (3 used on S12335)	.02
95-922	Power Transformer (117 V. 50-60 Cycle((T5)	6.90
112-268	#6 x 7/8 R.H. Shakeproof S.T. Screw (Spk. Mtg.)	.02
114-128	#10 x 1-1/16 Hex. Washer Hd. S. T. Screw (Chassis Mtg)	1.81C
114-132	#10 x 1-5/8 Hex. Washer Hd. S.T. Screw (050R-051E-052R)	.05
126-382	Tube Shield	.08
159-27	Plug Button-Statuary Bronze (050R)	.12
188-54	Knob Clamping Ring	.02
192-100	Dial Crystal	1.75
196-81	Dust Gasket (051E-052R)	.40
202-389	Instruction Book	.06
S11558	Volume Control Knob Assem. (46-520)	.28
S12305	Band Sw. Knob & Ring Assem. (46-598)	.32
S12335	Band Sw. & Spark Plate Cond. Assem.	5.23

RADIORGAN PARTS

57-1138	Radiorgan Escutcheon (2 used)	.42
76-444	Radiorgan Knob Retaining Pin	.04
80-447	Radiorgan Retaining Spring	.05
S9595	Radiorgan Strip & Contact Assem. (2 used)	.31
S11416	Radiorgan Knob & Eyelet Assem. (Lo-Bass)	.16
S11417	Radiorgan Knob & Eyelet Assem. (Bass)	.16
S11418	Radiorgan Knob & Eyelet Assem. (Alto)	.16
S12267	Radiorgan Bracket Assem. (2 used)	.72
S12286	Radiorgan Knob & Eyelet Assem. (Treble)	.16
S12287	Radiorgan Knob & Eyelet Assem. (Voice)	.16
S12288	Radiorgan Knob & Eyelet Assem. (Normal)	.16
S12289	Radiorgan Escutcheon & Knob Assem. (Complete) (Lo-Bass, Bass, Alto)	1.79
S12290	Radiorgan Escutcheon & Knob Assem. (Complete) (Treble, Voice, Normal)	1.79

WAVEMAGNET PARTS

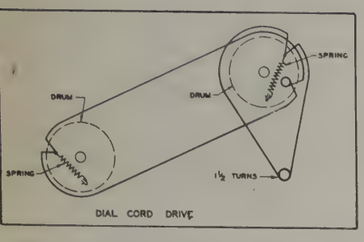
12-1138	Wavemagnet Mtg. Bracket (061 & 061G)	.14
58-88	Wavemagnet Three Prong Plug	.07
114-202	#8-32 x 1-1/8 Hex Slotted Washer Hd. S. T. Screw	.03
S11461	Wavemagnet Assem. Complete (#30B (050) (L1)	1.00
S11589	Wavemagnet Assem. Complete (#30D) (061-061G)	4.00
S12113	Wavemagnet Assem. Complete (30G) (050R)	1.09
S12307	Wavemagnet Assem. Complete (#29B) (032)	1.40
S12537	Wavemagnet Assem. Complete (#30J) (051E-052R)	1.36


ANT.
1.5 X AT 600 KC. 1.4 X AT 98 MC.
6.5 X AT 600 KC. 4.2 X AT 98 MC.
13 X FROM 600 KC. TO 455 KC. 5 X FROM 98 MC. TO 8.3 MC.
4.6 X AT 455 KC. 56. X AT 8.3 MC.
8.2 X FROM 455 KC. TO 400~
52 X AT 400~ 1 WATT OUTPUT
27 X AT 8.3 MC.
BOTTOM VIEW OF TUBE SOCKETS.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C.-D.C. OR VACUUM TUBE VOLTMETER.
6AG5 R.F.
6SB7 CONVERTER
6SG7/GT 1ST I.F.
6SH7 2ND I.F.
6SH7 LIMITER
6S8GT DISCRIMINATOR DET. 1ST AUDIO
6K6GT PWR. AMP.
TOP VIEW OF SOCKET
PIN END VIEW OF PLUG
ANT. LOADING COIL
F.M. DET. COIL
F.M. OSC. COIL
1ST I.F. TRANS. 8.3 MC.
2ND I.F. TRANS. 8.3 MC.
3RD I.F. TRANS. 8.3 MC.
DISC. I.F. TRANS. 8.3 MC.
F.M. ANT. COIL
WAVE TRAP COIL
BC. DET. COIL
BC. OSC.
VOL. CONTROL
SEE SPEAKER TABLE BELOW
BAND SWITCH S1 SHOWN IN ST'D. BROADCAST POSITION
BAND SWITCH POSITIONS
1ST POS. ST'D. BROADCAST
2ND POS. FM 100
3RD POS. FM 45
2 WHITE DOTS
THIS DOT ON FAR SIDE
GR DOT
5Y3GT RECT. 322V
SPEAKER FIELD
700 Ω (HOT)
315VAC
TREBLE (CLOSED)
LO BASS (OPEN)
ALTO (OPEN)
BASS (OPEN)
NORMAL (OPEN)
VOICE (OPEN)
TONE CONTROL SWITCH
TO ANTENNA TERMINAL STRIP FM CONNECTION
117 V AC.
70 WATTS
SWITCH ON VOL. CONTROL R16
AMP. MOD. I.F. FREQUENCY 455 KC.
FREQ. MOD. I.F. FREQUENCY 8.3 MC.
TUNING RANGES
540 - 1620 KC. STD. BC.
88 - 108 MC. FM. 100
42 - 48.5 MC. FM. 45
SPI SPEAKER TABLE
CHASSIS | MODEL | SPEAKER
8C20 | 8H032 | 49-544 6"X9"
8C20 | 8H050R | 49-564 10"
8C20 | 8H051E | 49-564 10"
8C20 | 8H061 | 49-536 10"
8C20 | 8H061G | 49-536 10"
8C20 | 8H052R | 49-564 10"
ALL RESISTORS ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

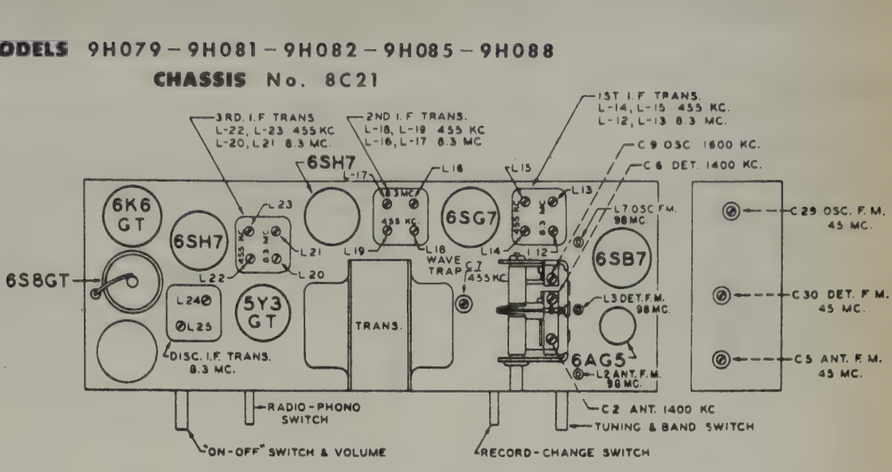
MODELS 8H032 – 8H033 – 8H050 – 8H051 – 8H052 – 8H061

CHASSIS No. 8C20

MODELS 9H079 – 9H081 – 9H082 – 9H085 – 9H088
CHASSIS No. 8C21



DIAL CABLE DRAWING



TUBE TRIMMER LOCATION

TO THE SERVICE MAN:

The 8C21 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'S. Observe the same precautions when making adjustments. The second 8.3 Mc IF stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides a satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. THE LOAD RESISTOR MUST BE REMOVED AFTER ALIGNMENT.

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 6) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-14, 15, 18, 19, 22 and 23	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	C7	Adjust wavetrap for minimum output
3	2 turns loosely cpld. to wavemaqnet		1600 Kc. Modulated	BC	1600 Kc.	C9	Set oscillator to dial scale
4	2 turns loosely cpld. to wavemaqnet		1400 Kc. Modulated	BC	1400 Kc.	C2 & C6	Align det. and ant. stages
5(a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L-24 coil slug primary discriminator	Align primary of discriminator for maximum reading
6(b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L-25 coil slug sec. of discriminator	Adjust secondary of discriminator for zero reading
7(c)	Pin 4 (grid) on 6SH7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L20 & L21 Prim. & Sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
8(c)(d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L16 & L17 Primary & Sec. of 2nd IF transformer	Align2nd IF transformer for maximum reading
9(c)(d)	Pin 8 grid on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L12 & L13 Primary & Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
10(c)	Antenna Post (Remove line ant.)	270 Ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Oscillator coil slug	Set oscillator to dial scale
11(c)	Antenna Post (Remove line ant.)	270 Ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L2 and L3 Det. and RF coil slugs	Align det. and ant. stages to maximum reading
12(c)	Antenna Post (Remove line ant.)	270 Ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C29	Set oscillator to dial scale
13(c)	Antenna Post (Remove line ant.)	270 Ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C5 and C30	Align detector & ant. stages for maximum reading

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resister of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

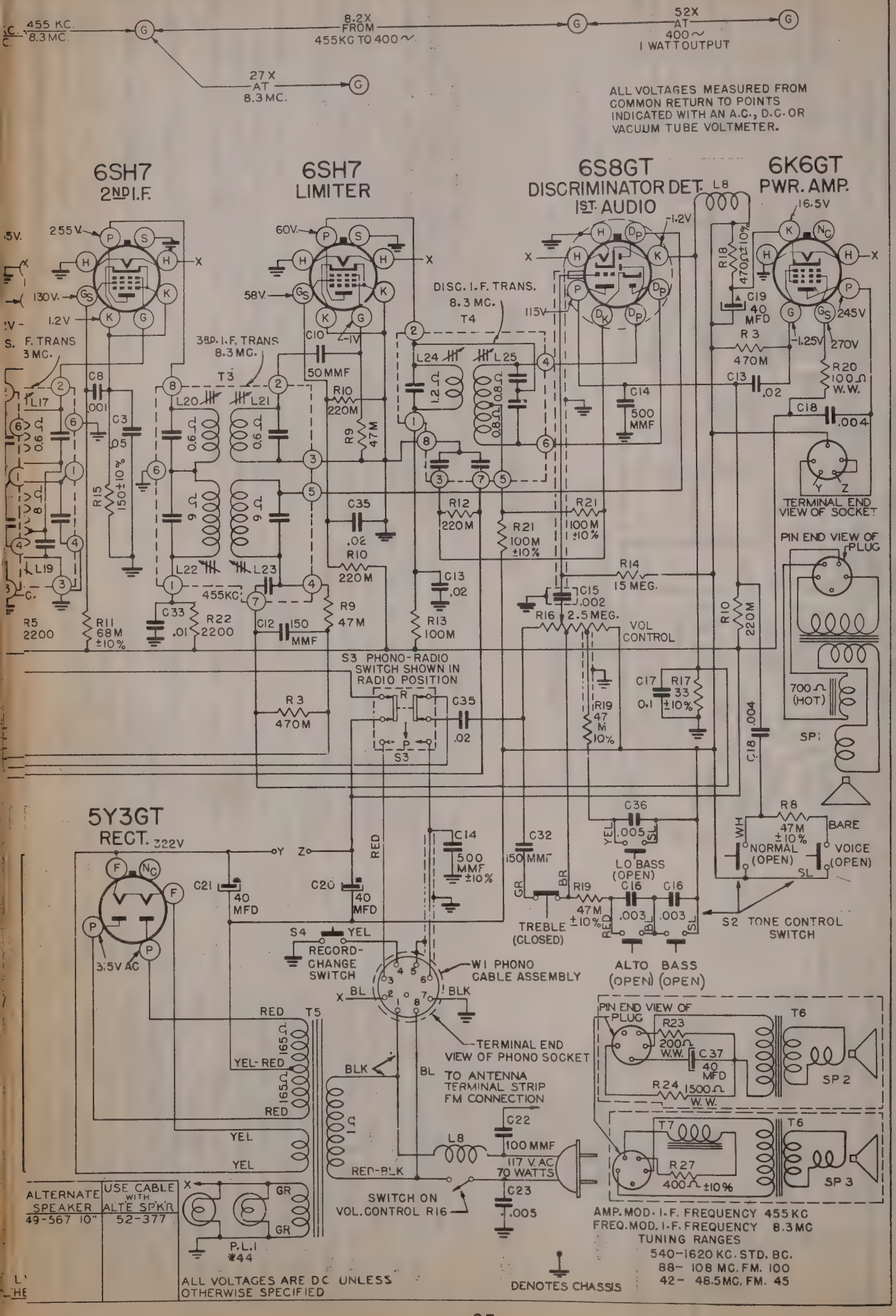
An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)
(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)
(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4) to chassis.
(d) 300 ohm ½ watt carbon resistor soldered across the secondary L17 (pin 2 and 3 of 2nd, IF transformer. The leads to the resistor must be as short as possible and the resistor removed before operation 10 is started.

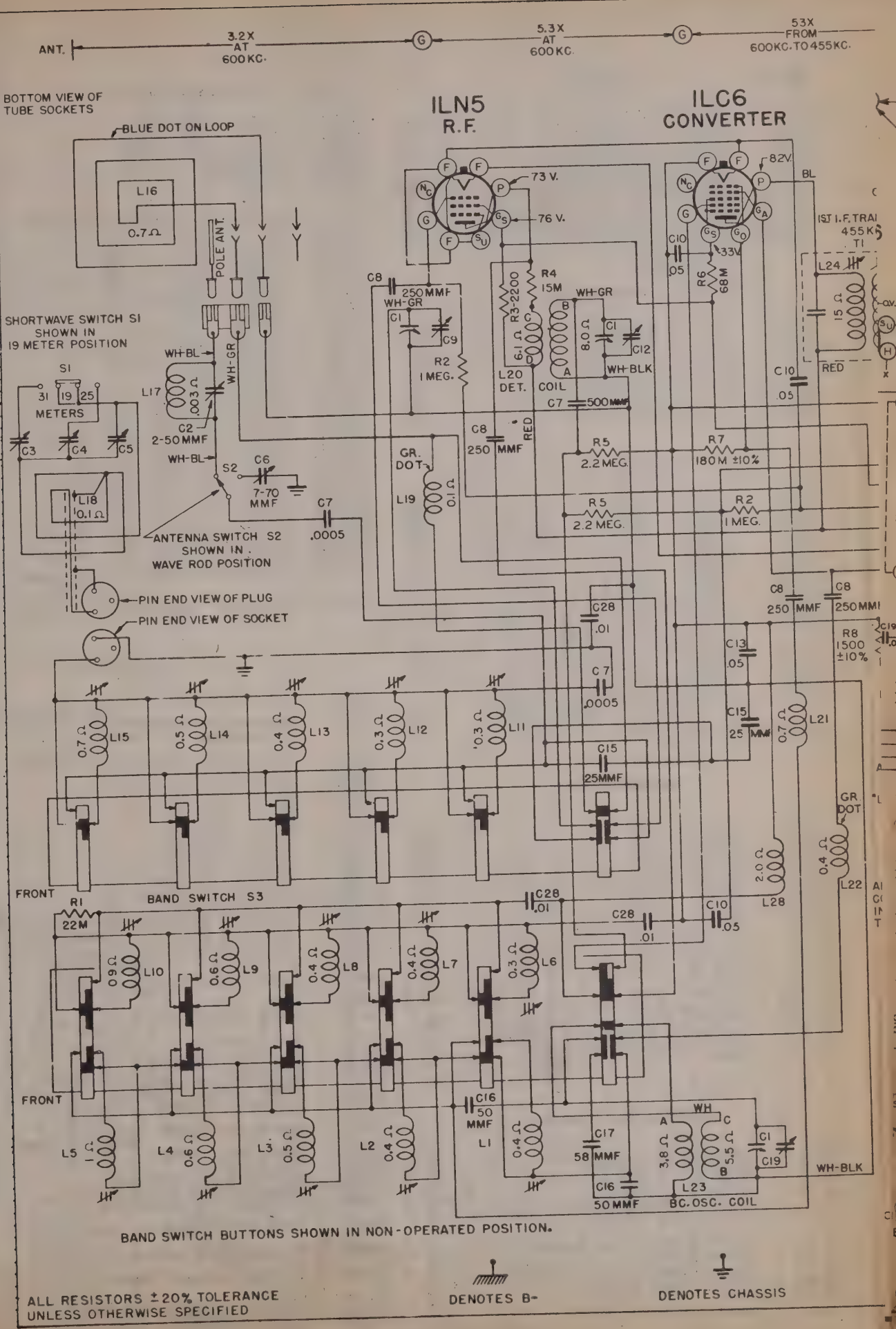
PARTS LIST
MODELS 9H079-079E-079R-081-082E-082R-085R-088R

PART NO.	DESCRIPTION	PRICE
26-361	DIAL ASSEMBLY	12.00
78-699	DIAL SCALE	.40
80-402	DIAL POINTER CONTROL SHAFT	.60
78-692	DIAL LIGHT SOCKET & WIRE	.20
80-445	DIAL CORD TENSION SPRING	.10
149-396	TUNER ARM PRESSURE SPRING	.10
159-50	DIAL LIGHT BULB	.10
188-304	TUNING IRON CORE & SPRING (3 USED)	.60
27-1054	DIAL SCALE SNAP BUTTON	.01
78-224	RETAINING RING	.20
78-349	POINTER PULLEY & BUSHING ASSEM.	.16
S11358	POINTER PULLEY CORD & EYELET	.01
S12239	DRIVE PULLEY CORD & EYELET ASSEM.	.01
S11357	TUNER ARM ASSEM. (ON GANG)	.20
S11292	PULLEY & CAM ASSEM. (ON GANG)	.60
S8326	WAVE TRAP COIL & TRIMMER ASSEM.	.40
S11156	A.M. OSCILLATOR COIL ASSEM. (L4)	.40
S12251	B.C. DETECTOR COIL ASSEM. (L3)	.40
S12252	B.C. OSCILLATOR COIL ASSEM. (L6)	.40
S12253	3RD I.F. TRANSFORMER ASSEM. (L5)	.40
S12254	DISCRIMINATOR TRANSFORMER ASSEM.	2.78
S12255	WAVE TRAP COIL & TRIMMER ASSEM.	.40
S12256	F.M. ANTENNA COIL ASSEM. (L8)	.40
S12257	F.M. DETECTOR COIL ASSEM. (L9)	.40
S12258	F.M. OSCILLATOR COIL ASSEM. (L7)	.40
S12259	2ND I.F. TRANSFORMER ASSEM. (L10)	.40
S13571	WAVE TRAP COIL ASSEM. PART OF S12255	.40
80-447	SHAFT BEARING DISC	.01
80-595	RECORD CHANGER PULL-OUT HANDLE	.07
S12283	RADIO-PHONO KNOB & CONTACT ASSEM.	.72
S12284	RADIO-PHONO KNOB & EYELET ASSEM. (LOW-BASS)	.16
S12285	RADIO-PHONO KNOB & EYELET ASSEM. (BASS)	.16
S12286	RADIO-PHONO KNOB & EYELET ASSEM. (TREBLE)	.16
S12287	RADIO-PHONO KNOB & EYELET ASSEM. (NORMAL)	.16
S12288	RADIO-PHONO KNOB & EYELET ASSEM. (HIGH-TREBLE)	.16
S12289	RADIO-PHONO KNOB & EYELET ASSEM. (HIGH-BASS)	.16
S12290	RADIO-PHONO KNOB & EYELET ASSEM. COMPLETE (TREBLE, BASS & KNOB ASSEM.)	1.79
S12291	RADIO-PHONO KNOB & EYELET ASSEM. NORMALITE (TREBLE, BASS & KNOB ASSEM.)	1.79
78-439	SOCKET - MINIATURE TUBE	.12
78-501	SOCKET - PHONO PLUG (9 CONTACT)	.12
80-397	TUBE RETAINING SPRING	.10
95-592	RE-JECT SWITCH (OPEN-CLOSE)	.60
80-445	TUNER ARM PRESSURE SPRING	.10
149-396	DIAL LIGHT IRON CORE & SPRING (3 USED)	.10
159-50	DIAL LIGHT BULB	.10
188-304	TUNING IRON CORE & SPRING (3 USED)	.60
27-1054	DIAL SCALE SNAP BUTTON	.01
78-224	RETAINING RING	.20
78-349	POINTER PULLEY & BUSHING ASSEM.	.16
S11358	POINTER PULLEY CORD & EYELET	.01
S12239	DRIVE PULLEY CORD & EYELET ASSEM.	.01
S11357	TUNER ARM ASSEM. (ON GANG)	.20
S11292	PULLEY & CAM ASSEM. (ON GANG)	.60


455 KC. 8.3 MC.
8.2X FROM 455KC TO 400~
52X AT 400~ 1 WATT OUTPUT
27X AT 8.3 MC.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
6SH7 2ND I.F.
6SH7 LIMITER
6S8GT DISCRIMINATOR DET. 1ST AUDIO
6K6GT PWR. AMP.
DISC. I.F. TRANS. 8.3 MC. T4
3RD. I.F. TRANS 8.3 MC. T3
S. F. TRANS 3 MC.
TERMINAL END VIEW OF SOCKET
PIN END VIEW OF PLUG
S3 PHONO-RADIO SWITCH SHOWN IN RADIO POSITION
VOL CONTROL
5Y3GT RECT. 322V
3.5V AC
S4 RECORD-CHANGE SWITCH
W1 PHONO CABLE ASSEMBLY
TERMINAL END VIEW OF PHONO SOCKET
TO ANTENNA TERMINAL STRIP FM CONNECTION
SWITCH ON VOL. CONTROL R16
S2 TONE CONTROL SWITCH
TREBLE (CLOSED)
ALTO BASS (OPEN) (OPEN)
LO BASS (OPEN)
NORMAL (OPEN)
VOICE (OPEN)
BARE
ALTERNATE SPEAKER 49-567 10"
USE CABLE WITH ALTE SPKR 52-377
P.L.1 #44
ALL VOLTAGES ARE DC UNLESS OTHERWISE SPECIFIED
DENOTES CHASSIS
AMP. MOD. I.F. FREQUENCY 455 KC
FREQ. MOD. I.F. FREQUENCY 8.3 MC
TUNING RANGES
540-1620 KC. STD. BC.
88- 108 MC. FM. 100
42- 48.5 MC. FM. 45

MODELS 9H079 – 9H081 – 9H082 – 9H085 – 9H088

CHASSIS No. 8C21


ANT.
3.2X AT 600KC.
5.3X AT 600KC.
53X FROM 600KC. TO 455KC.
BOTTOM VIEW OF TUBE SOCKETS
ILN5 R.F.
ILC6 CONVERTER
BLUE DOT ON LOOP
L16
0.7Ω
POLE ANT.
SHORTWAVE SWITCH S1 SHOWN IN 19 METER POSITION
S1
31 19 25
METERS
C3 C4 C5
L18 0.1Ω
L17 .003Ω
C2 2-50MMF
WH-BL
WH-GR
S2
C6 7-70 MMF
C7 .0005
ANTENNA SWITCH S2 SHOWN IN WAVE ROD POSITION
PIN END VIEW OF PLUG
PIN END VIEW OF SOCKET
73 V.
76 V.
82V.
33V
C8 250MMF WH-GR
C1
C9
R2 1 MEG.
R3 2200
6.1Ω
R4 15M
L20 DET. COIL
8.0Ω
C1
C12
WH-BLK
C7 500MMF
C8 250 MMF RED
GR. DOT
L19 0.1Ω
R5 2.2 MEG.
R5 2.2 MEG.
R7 180M ±10%
R2 1 MEG.
C10 .05
R6 68M
1ST I.F. TRANS 455KC
T1
L24
15Ω
RED
C10 .05
C8 250 MMF
C8 250MMF
R8 1500 ±10%
C28 .01
C7 .0005
C13 .05
C15 25 MMF
C15 25MMF
L15 0.7Ω
L14 0.5Ω
L13 0.4Ω
L12 0.3Ω
L11 0.3Ω
L21 0.7Ω
GR. DOT
L22 0.4Ω
L28 2.0Ω
FRONT
BAND SWITCH S3
R1 22M
C28 .01
C28 .01
C10 .05
L10 0.9Ω
L9 0.6Ω
L8 0.4Ω
L7 0.4Ω
L6 0.3Ω
FRONT
C16 50 MMF
L1 0.4Ω
C17 58 MMF
C16 50MMF
L5 Ω
L4 0.6Ω
L3 0.5Ω
L2 0.4Ω
WH
A C
B
3.8Ω 5.5Ω
C1
C19
WH-BLK
L23
BC. OSC. COIL
BAND SWITCH BUTTONS SHOWN IN NON-OPERATED POSITION.
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED
DENOTES B-
DENOTES CHASSIS

PARTS LIST

PART NO.		PRICE
*49-537	12" DYNAMIC SPEAKER	13.50
	206-537 OUTPUT TRANSFORMER	2.63
	207-537 FIELD COIL (NOT RE-PLACEABLE)	---
	208-537 CONE & VOICE COIL	4.60
57-1134	DIAL ESCUTCHEON	5.80
58-88	THREE PRONG WAVEMAGNET PLUG	.07
58-133	NINE PRONG PLUG (USED ON S12606)	.12
70-83	#6 x 1/2 R.H. WASHER TYPE WOOD SCREW (CAB. BACK MTG.)	.55c
72-59	#2 x 1/2 FLAT PHILLIPS HD. WOOD SCREW (ESC. MTG.)	.02
78-582	NINE PRONG SOCKET (USED ON S12606)	.20
80-407	PHONO UNIT MTG. SPRING	.02
83-1150	RUBBER TRIM STRIP	.84
112-420	1/4-28 SPECIAL OVAL HD.M.S. (PHONO UNIT MTG.)	.33
112-489	HANDLE MTG. SCREW (36-31)	.03
114-148	CHASSIS MTG. SCREW (4 USED)	1.20c
114-202	#8-32 x 1-1/8 SLOTTED HEX WASHER HD. S.T. SCREW (USED ON 12-1138)	.03
114-233	PHONO SHIPPING SCREW	.07
159-52	PLUG BUTTON (4 USED)	.09
188-48	KNOB DECORATIVE RING	.04
188-54	KNOB CLAMPING RING	.02
192-100	DIAL CRYSTAL	1.75
202-426	PHONO INSTRUCTION BOOK	.12
202-440	INSTRUCTION BOOK	.12
S11454	RECORD CHANGER MTG. FRAME ASSEM.	5.45
S11558	VOL. CON. KNOB & RING ASSEM. (46-520)	.28
S11607	WAVEMAGNET ASSEM. (#30C)	3.57
S11640	PRE-AMP. ASSEM.	---
S11680	INTER-MIXER RECORD CHANGER ASSEM.	---
S12305	BAND SW. KNOB & RING ASSEM. (46-598)	.32
S12606	INTERCONNECTING CABLE ASSEM.	5.47
S12864	PHONO FRAME DRIVE WHEEL & TIRE ASSEM. (2 USED)	.24
S13135	CABINET F. M. DIPOLE ANTENNA ASSEM.	.70
	*NOTE: FOR CONVERSION TO P.M. SPEAKER SEE SUPPLEMENTARY LIST.	

MODEL 9H082E-082R (Chassis 8C21)

12-1183	DOOR STOP & RETURN BRKT.	.04
12-1265	SPEAKER BRKT.	.05
15-62	PLUG CAP & INSULATOR (USED ON S12591)	.22
15-64	PLUG CAP & INSULATOR (USED ON S12607)	.06
15-65	PLUG CAP & INSULATOR (USED ON S12607)	.27
15-67	PLUG CAP & INSULATOR (USED ON S12607)	.07
19-123	PHONO UNIT MTG. CLIP (4 USED)	.10
22-1501	DRY ELECTROLYTIC - 150 MFD. - 60 V.	3.40
36-31	RECORD CHANGER PULL-OUT HANDLE	.57
46-522	CONTROL KNOB (DUMMY)	.11
46-538	TUNING CONTROL KNOB	.10
46-548	RADIO-PHONO REJECT KNOB (2 USED)	.07
49-560	10" DYNAMIC SPEAKER	11.00
	206-560 OUTPUT TRANSFORMER	2.57
	207-560 FIELD COIL (NOT RE-PLACEABLE)	---
	208-560 CONE & VOICE COIL	3.41
52-188	TWO CONTACT PLUG & WIRE (USED ON S12607)	.24
57-1134	DIAL ESCUTCHEON	5.80
58-86	TWO CONTACT PLUG (USED ON S12591)	.12
58-88	THREE PRONG WAVEMAGNET PLUG	.07
58-132	SIX PRONG MALE PLUG (USED ON S12412)	.12
58-133	NINE PRONG PLUG (USED ON S12607)	.12
70-101	#10 x 1" R.H. WOOD SCREW (4 USED FOR MTG. MOTOR MTG. BRACKET)	.01
72-59	#2 X 1/2 FLAT PHILLIPS HD. WOOD SCREW (ESC. MTG.)	.02
78-555	SIX CONTACT SOCKET (USED ON S12591)	.11
80-407	PHONO UNIT MTG. SPRING (1 USED)	.02
80-443	PHONO DOOR RETURN SPRING	.18
80-463	PHONO UNIT MTG. SPRING (4 USED)	.03
83-1240	BLACK VINYLITE TRIM STRIP	.75
8 5-351	DRIVE OUT CONTROL SW. (USED ON S12591)	1.90
85-385	S.P.D.T. TOGGLE SW. (LIFT LIMITING) (USED ON S12591)	1.50
93-168	RUBBER WASHER (6 USED) (CHASSIS MTG.)	.07
93-540	RUBBER WASHER (4 USED)	.10
94-502	MOTOR MTG. BUSHING	.03
112-268	SPEAKER PLUG RETAINING SCREW	.02
112-420	1/4-28 SPECIAL OVAL HD. M.S. (PHONO UNIT MTG.) (OR SUB 112-611)	.33
112-489	HANDLE MTG. SCREW (36-31)	.03
114-132	CHASSIS MTG. SCREW (#10X1-5/8 HEX WASHER HD. S.T.)	.05
125-56	SPEAKER MTG. GROMMET	.05
126-518	HEAT SHIELD	.06
126-519	HEAT SHIELD	.08
143-44	DRIVE OUT COUPLING (USED ON S12412)	.45
188-48	KNOB DECORATIVE RING	.04
188-54	KNOB CLAMPING RING	.02
192-100	DIAL CRYSTAL	1.75
196-81	DUST GASKET	.40
202-426	PHONO INSTRUCTION BOOK	.12
202-440	INSTRUCTION BOOK	.12
S11558	VOL. CON. KNOB & RING ASSEM. (46-520)	.28
S11640	PRE-AMP. ASSEM.	---
S11680	INTER-MIXER RECORD CHANGER ASSEM.	---
S12305	BAND SW. KNOB & RING ASSEM. (46-598)	.32
S12394	WAVEMAGNET ASSEM. (#30K)	1.67
S12411	BALL BEARING SHAFT & WASHER ASSEM.	5.53
S12412	MOTOR & MOTOR MTG. BRKT. ASSEM. (141-91)	34.50
S12413	PHONO UNIT MTG. FRAME & BRKT. ASSEM.	7.00
S12591	DRIVE OUT SWITCH, PLUG & CABLE ASSEM.	5.29
S12607	INTERCONNECTING CABLE ASSEM.	5.06

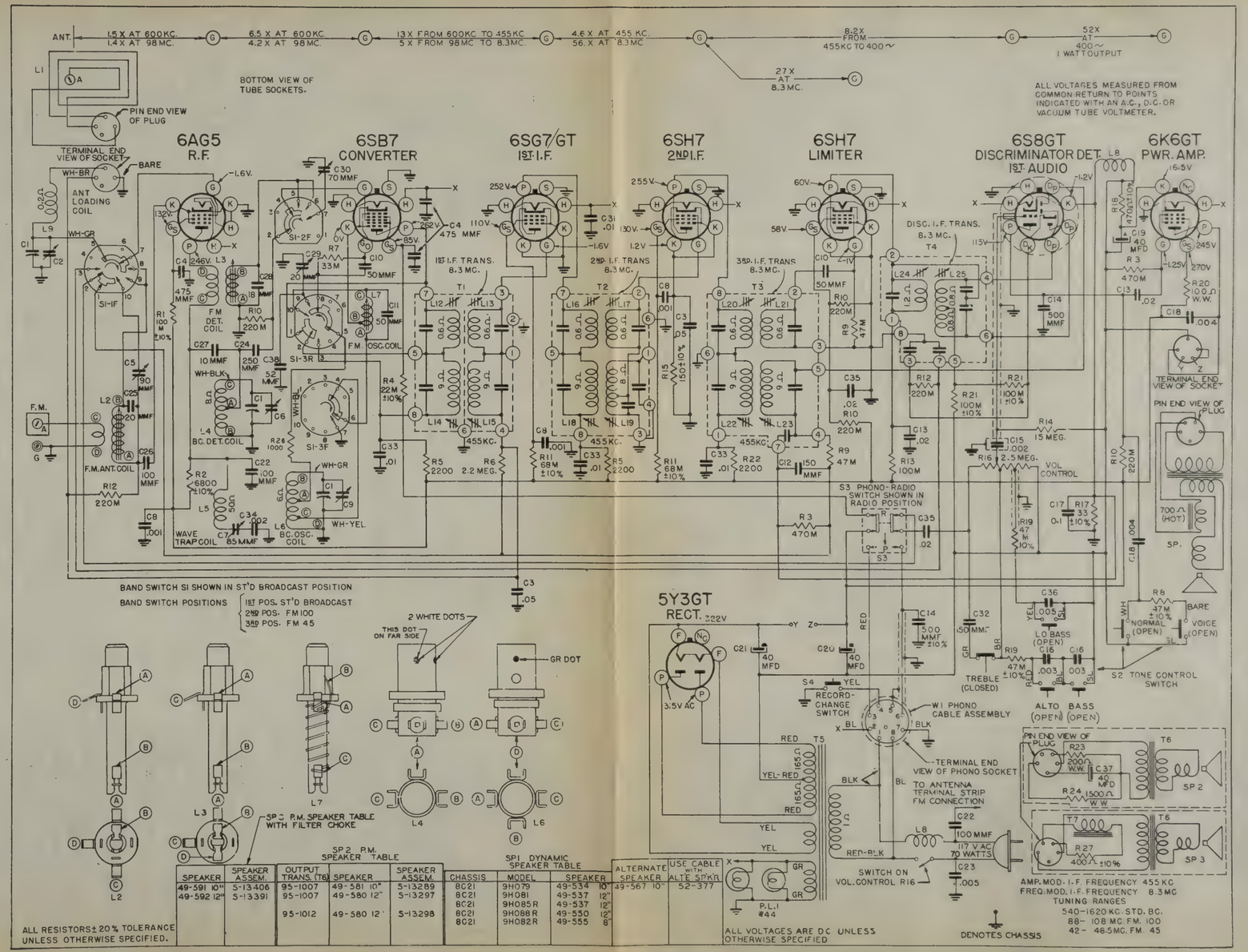
MODEL 9H088R (Chassis 8C21)

12-1138	WAVEMAGNET MTG. BRKT.	.14
15-64	PLUG CAP & INSULATOR (USED ON S12604)	.06
15-65	PLUG CAP & INSULATOR (USED ON S12604)	.27
15-67	PLUG CAP & INSULATOR (USED ON S12604)	.08
19-123	PHONO UNIT MTG. CLIP (4 USED)	.10
24-388	RECORD CHANGER COMPARTMENT COVER	.86
46-522	CONTROL KNOB (DUMMY)	.11
46-538	TUNING CONTROL KNOB	.10
46-548	RADIO-PHONO REJECT KNOB (2 USED)	.07
*49-550	12" DYNAMIC SPEAKER	13.50
	206-550 OUTPUT TRANSFORMER	2.63
	207-550 FIELD COIL (NOT RE-PLACEABLE)	---
	208-550 CONE & VOICE COIL	4.60
57-1134	DIAL ESCUTCHEON	5.80
58-88	THREE PRONG WAVEMAGNET PLUG	.07
58-133	NINE PRONG PLUG (USED ON S12604)	.12
70-96	#10 X 1-3/4 R.H. WOOD SCREW (SUPPORT BRKT. MTG.)	.02
72-59	#2 x 1/2 FLAT PHILLIPS HD. WOOD SCREW (EXC. MTG.)	.02
78-582	NINE PRONG SOCKET (USED ON S12604)	.20
80-407	PHONO UNIT MTG. SPRING (4 USED)	.02
80-450	SPRING - BRAKE	.19
83-1150	RUBBER TRIM STRIP	.84
83-1230	NOISE REDUCER STRIP	.06
112-268	SPEAKER PLUG RETAINING SCREW	.02
112-420	1/4-28 SPECIAL OVAL HD. M.S. (PHONO UNIT MTG.) (OR SUB 112-611)	.33
114-148	CHASSIS MTG. SCREW (4 USED)	1.20c
114-202	#8-32 X 1-1/8 SLOTTED HEX WASHER HD. S.T. SCREW (USED ON 12-1138)	.03
114-257	PHONO UNIT SHIPPING SCREW (OR SUB 114-263)	.03
188-48	KNOB DECORATIVE RING	.04
188-54	KNOB CLAMPING RING	.02
192-100	DIAL CRYSTAL	1.75
202-426	PHONO INSTRUCTION BOOK	.12
202-440	INSTRUCTION BOOK	.12
S10796	LID SUPPORT ARM, HINGE PLATE & BRKT. ASSEM. (R.H.)	1.85
S10797	LID SUPPORT ARM, HINGE PLATE & BRKT. ASSEM. (L.H.)	1.85
S11429	RECORD CHANGER SUPPORT FRAME & ARM ASSEM.	10.08
S11558	VOL. CON. KNOB & RING ASSEM. (46-520)	.28
S11640	PRE-AMP. ASSEM.	---
S11680	INTER-MIXER RECORD CHANGER ASSEM.	---
S12112	WAVEMAGNET ASSEM. (#30S)	3.43
S12305	BAND SW. KNOB & RING ASSEM. (46-598)	.32
S12545	PHONO LIFT SPRING & BUSHING ASSEM.	.43
S12604	INTERCONNECTING CABLE ASSEM.	5.54
S13135	CABINET F.M. DIPOLE ANTENNA ASSEM.	.70
	*NOTE: FOR CONVERSION TO P.M. SPEAKER SEE SUPPLEMENTARY LIST.	

MODELS 9H079-79E-79R-081-85R-88R

TO REPLACE THE ELECTRO DYNAMIC SPEAKER WITH A P.M. TYPE THE FOLLOWING ADDITIONAL PARTS ARE NECESSARY.

S13289	10" P.M. SPKR. ASSEM. COMPLETE (ALT. FOR 49-534) (079-79E-79R)	
S13297	12" P.M. SPKR. ASSEM. COMPLETE (ALT. FOR 49-537) (081-85R)	
S13298	12" P.M. SPKR. ASSEM. COMPLETE (ALT. FOR 49-550 (9H088R)	
22-1611	ELECT. COND. 40 MFD. - 450 VOLT (C33)	1.81
49-580	12" P.M. SPKR. (081-85R-88R)	
49-581	10" P.M. SPKR. (079-79E-79R)	
58-158	SPEAKER PLUG	.14
63-1189	RESISTOR 200 OHM W.W. 2 WATT INSL.	.36
63-1529	RESISTOR 1500 OHM W.W. 5 WATT INSL.	.43
83-1236	TERMINAL STRIP	.15
95-1007	SPKR. OUTPUT TRANSFORMER (079-79E-79R-081-85R)	
95-1012	SPKR. OUTPUT TRANSFORMER (088R)	
237-1	CABLE CLAMP	.02


ANT.
1.5 X AT 600KC. 1.4 X AT 98 MC.
6.5 X AT 600KC. 4.2 X AT 98 MC.
13 X FROM 600KC TO 455KC 5 X FROM 98MC TO 8.3MC.
4.6 X AT 455 KC. 56. X AT 8.3 MC
8.2X FROM 455KC TO 400~
52X AT 400~ 1 WATT OUTPUT
27 X AT 8.3 MC.
BOTTOM VIEW OF TUBE SOCKETS.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
PIN END VIEW OF PLUG
TERMINAL END VIEW OF SOCKET
6AG5 R.F.
6SB7 CONVERTER
6SG7/GT 1ST I.F.
6SH7 2ND I.F.
6SH7 LIMITER
6S8GT DISCRIMINATOR DET. 1ST AUDIO
6K6GT PWR. AMP.
ANT LOADING COIL
FM DET. COIL
FM. OSC. COIL
F.M. ANT. COIL
BC. DET. COIL
BC. OSC. COIL
WAVE TRAP COIL
1ST I.F. TRANS. 8.3 MC.
2ND I.F. TRANS 8.3 MC.
3RD I.F. TRANS. 8.3 MC.
DISC. I.F. TRANS. 8.3 MC.
S3 PHONO-RADIO SWITCH SHOWN IN RADIO POSITION
VOL CONTROL
BAND SWITCH S1 SHOWN IN ST'D BROADCAST POSITION
BAND SWITCH POSITIONS
1ST POS. ST'D BROADCAST
2ND POS. FM100
3RD POS. FM 45
5Y3GT RECT.
RECORD-CHANGE SWITCH
W1 PHONO CABLE ASSEMBLY
TERMINAL END VIEW OF PHONO SOCKET
TO ANTENNA TERMINAL STRIP FM CONNECTION
SWITCH ON VOL. CONTROL R16
TREBLE (CLOSED)
LO BASS (OPEN)
ALTO BASS (OPEN)
S2 TONE CONTROL SWITCH
2 WHITE DOTS
THIS DOT ON FAR SIDE
GR DOT
SP. P.M. SPEAKER TABLE WITH FILTER CHOKE
SP2 P.M. SPEAKER TABLE
SP1 DYNAMIC SPEAKER TABLE
ALTERNATE SPEAKER
USE CABLE WITH ALTE SPKR
49-567 10"
52-377
P.L.I #44
ALL VOLTAGES ARE DC UNLESS OTHERWISE SPECIFIED
ALL RESISTORS ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
AMP. MOD. I.F. FREQUENCY 455 KC
FREQ. MOD. I.F. FREQUENCY 8.3 MC
TUNING RANGES
540-1620 KC. STD. BC.
88-108 MC. FM. 100
42-46.5 MC. FM. 45

SPEAKER	SPEAKER ASSEM.	OUTPUT TRANS. (T6)	SPEAKER	SPEAKER ASSEM.
49-591 10"	S-13406	95-1007	49-581 10"	S-13289
49-592 12"	S-13391	95-1007	49-580 12"	S-13297
		95-1012	49-580 12"	S-13298

CHASSIS	MODEL	SPEAKER	
8C21	9H079	49-534	10"
8C21	9H081	49-537	12"
8C21	9H085R	49-537	12"
8C21	9H088R	49-550	12"
8C21	9H082R	49-555	8"

MODELS 9H079 - 9H081 - 9H082 - 9H085 - 9H088
CHASSIS No. 8C21

MODEL 8G005
CHASSIS 8C40

TO THE SERVICE MAN:

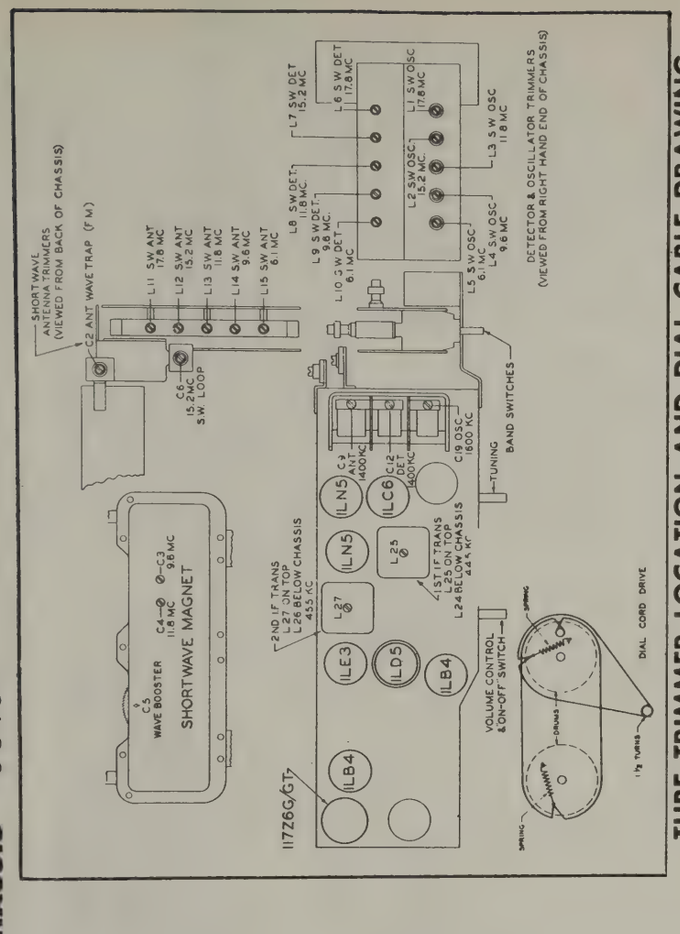
Chassis 8C40 features a high gain tuned RF stage ahead of a conventional superheterodyne circuit with band spread tuning on the 49, 31, 25, 19 and 16 meter bands.

The audio amplifier used in chassis 8C40 features phase inversion and push-pull power output.

If removal of the chassis from the cabinet ever becomes necessary this should be done with care.

The alignment of chassis 8C40 is conventional. However, care must be exercised when making adjustments, and the alignment procedure must be followed exactly. Set the chassis over a metal plate approximately the same distance the battery pack is from the bottom of the chassis when it is in the cabinet. This procedure will introduce the approximate amount of metal in the field of the RF and oscillator coils as when the chassis is in the cabinet. A signal generator of reasonable accuracy and good attenuation must be used. An output meter (AC) of the copper oxide rectifier type with a range of 1 to 30 volts in several steps is necessary to get accurate output readings. Alignment wrenches should be of the non-metallic type, especially when making adjustments at the higher frequencies.

When reinstalling the chassis in the cabinet be careful not to disturb the cabling between the short wave coil assembly and chassis. Tune in a weak broadcase signal near 1400 Kc. and touch up trimmer C9. This will insure maximum performance after alignment.


SHORTWAVE ANTENNA TRIMMERS (VIEWED FROM BACK OF CHASSIS)
C2 ANT WAVE TRAP (7 M)
L1 SW ANT 17.8 MC
L2 SW ANT 15.2 MC
L3 SW ANT 11.8 MC
L4 SW ANT 9.6 MC
L5 SW ANT 6.1 MC
C6 15.2 MC SW LOOP
C5 WAVE BOOSTER 11.8 MC
C4 C3 9.6 MC
SHORTWAVE MAGNET
L6 SW DET 17.8 MC
L7 SW DET 15.2 MC
L8 SW DET 11.8 MC
L9 SW DET 9.6 MC
L10 SW DET 6.1 MC
L2 SW OSC 15.2 MC.
L1 SW OSC 17.8 MC
L5 SW OSC 6.1 MC
L4 SW OSC 9.6 MC
L3 SW OSC 11.8 MC
DETECTOR & OSCILLATOR TRIMMERS (VIEWED FROM RIGHT HAND END OF CHASSIS)
2ND I.F. TRANS L27 ON TOP L26 BELOW CHASSIS 455 KC
1ST I.F. TRANS L25 ON TOP L24 BELOW CHASSIS 455 KC
C9 OSC. 1800 KC
C12 DET. 1400 KC
C9 ANT 1400 KC
VOLUME CONTROL & ON-OFF SWITCH
TUNING
BAND SWITCHES
DIAL CORD DRIVE
SPRING
1½ TURNS
11726G/GT
1LB4
1LE3
1LD5
1LB4
1LN5
1LN5
1LC6

TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT S.G. FREQUENCY	SET BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.1 mfd.	455 Kc.	BC	600 Kc.	L-24, 25, 26, 27	Align I. F.
2	One Turn Loop Coupled Loosely to Broadcast Wavemagnet		1800 Kc.	BC	1600 Kc.	C-19	Set Oscillator to Scale
3			1400 Kc.	BC	1400 Kc.	C-12	Alignment of Detector Sec.
4			1400 Kc.	BC	1400 Kc.	C-9	Alignment of B.C. Wavemagnet
5*	3 Feet of wire Approx. 1 foot from Extended Waverod		6.1 Mc.	49 Met.	6.1 Mc.	L-5, L-10 L-15	Alignment of S.W. Antenna, Detector and Oscillator
6*			9.6 Mc.	31 Met.	9.6 Mc.	L-4, L-9, L-14	
7*			11.8 Mc.	25 Met.	11.8 Mc.	L-3, L-8, L-13	
8*			15.2 Mc.	19 Met.	15.2 Mc.	L-2, L-7, L-12	
9*			17.8 Mc.	16 Met.	17.8 Mc.	L-1, L-6, L-11	
10	One Turn Loop Coupled Loosely to Shortwave Magnet, Waverod Collapsed		15.2 Mc.	19 Met.	15.2 Mc.	C-5, C-6	Alignment of Short-wave Magnet
11			11.8 Mc.	25 Met.	11.8 Mc.	C-4	
12			9.6 Mc.	31 Met.	9.6 Mc.	C-3	
13	When Receiving Normal Transmissions on the 49, 31, 25, 19 or 16 Meter Bands, if FM Interference is Experienced Adjust Wave Trap Trimmer C-2 for Minimum Response of the Interfering Signal.						

*NOTE: Rock Tuning Condenser When Making Alignment Under Operations 5,6,7,8 and 9.

PARTS LIST

PART NO.	DIAL ASSEMBLY	PRICE
26-335	Dial Scale	.40
59-155	Dial Pointer	.82
59-156	"On-Off" Indicator	.18
76-415	Tuning Control Shaft	.15
80-209	Drive Cord Tension Spring	.03
80-377	Indicator Tension Spring	.06
188-32	Retaining Ring	1.03C
61S11202	Drive Pulley and Rivet Assem. (On Gang)	.38
11S11204	Dial Drive Cord and Eyelet Assem.	.06
11S11205	Pointer Pulley Cord and Eyelet Assem.	.05
76S11206	Pointer Drive Shaft and Pulley Assem.	.38
117S11207	Indicator Lever and Bushing Assem.	.19

COILS AND CHOKES (CHASSIS)

95-912	1st I. F. Transformer (T1)	3.45
95-913	2nd I. F. Transformer (T2)	4.40
20S11210	Detector Coil Assem. (L20)	1.48
20S11211	Oscillator Coil Assem. (L23)	.59
20S11821	Wave Trap Coil Assem. (L17)	.20
20S11822	R.F. Choke Coil Assem. (L22)	.30
20S11823	R.F. Choke Coil Assem. (L21)	.35
20S11952	R.F. Shunt Coil Assem. (L28)	.20

CONDENSERS (CHASSIS)

22-147	500 Mmfd. (C22) ..... 600 V.	.26
22-470	150 Mmfd. (C26) ..... 600 V.	.20
22-805	.004 Mfd. (C27) ..... 600 V.	.20
22-811	.01 Mfd. (C24) ..... 600 V.	.20
22-813	.02 Mfd. (C20) ..... 200 V.	.20
22-817	.05 Mfd. (C10) ..... 200 V.	.20
22-818	.05 Mfd. (C29) ..... 400 V.	.20
22-820	.1 Mfd. (C21) ..... 200 V.	.23
22-953	.0002 Mfd. (C25) ..... 600 V.	.16
22-1063	.001 Mfd. (C23) ..... 600 V.	.20
22-1234	Dry Electrolytic - 40 Mfd. - 150 V. x 200 Mfd. - 10 V. (C33 and C34)	1.92
22-1373	Three Gang Variable (C1)	5.00
22-1390	500 Mmfd. (C7) ..... 600 V.	.26
22-1391	250 Mmfd. (C8) ..... 600 V.	.26
22-1425	Ceramic Trimmer (Wave Trap) (C2)	.27
22-1426	Dry Electrolytic - 40 x 20 x 10 Mfd. - 150 V. (C30, C31 and C32)	1.60
22-1430	.05 Mfd. (C13) ..... 200 V.	.20
22-1437	.01 Mfd. (C28) ..... 200 V.	.20

RESISTORS (CHASSIS)

63-238	1M Ohm (R15) ..... 1/4 Watt 10%.	.09
63-245	1500 Ohm (R8) ..... 1/4 Watt	.09
63-271	1 Megohm (R2) ..... 1/4 Watt	.09
63-583	1M Ohm (R9) ..... 1/4 Watt	.09
63-585	2200 Ohm (R3) ..... 1/4 Watt	.09
63-590	15M Ohm (R4) ..... 1/4 Watt	.09
63-591	22M Ohm (R1) ..... 1/4 Watt	.09
63-592	33M Ohm (R16) ..... 1/4 Watt	.09
63-594	68M Ohm (R6) ..... 1/4 Watt	.09
63-600	2.2 Megohm (R5) ..... 1/4 Watt	.09
63-602	4.7 Megohm (R10) ..... 1/4 Watt	.09
63-654	180M Ohm (R7) ..... 1/4 Watt	.09
63-771	120M Ohm (R13) ..... 1/4 Watt (Insl)	.19
63-976	15 Megohm (..... 1/4 Watt.....	.09
63-1042	1 Megohm (R14) ..... 1/4 Watt (Insl)	.19
63-1093	15 Megohms (R12) ..... 1/4 Watt	
63-1226	1200 Ohm (R17) ..... 1/2 Watt	.21
63-1343	Candohm (or 63-1359) (R19 and R20)	.63
63-1344	Volume Control and Switch (R11)	1.81
63-1361	88 Ohm (R18) ..... 2 Watts	.36

MISCELLANEOUS (CHASSIS)

11-66	Line Cord and Plug	.65
15-34	Battery Cable Plug Cap	.07
44-17	Phono Jack (J1)	.24
49-517	5 1/4" P. M. Speaker	9.00
	208-517 Output Transformer	1.97
	208-517 Cone and Voice Coil	1.73
73-8	Set Screw (Gang Drive Pulley)	.02
78-229	Socket Electrolytic	.03
78-396	Socket - Female Battery (4 Contact)	.12
78-548	Socket - Octal (117Z6GT)	.12
78-549	Socket - Loktal (1LN5)	.18
78-597	Socket - Loktal (1LB4)	.18

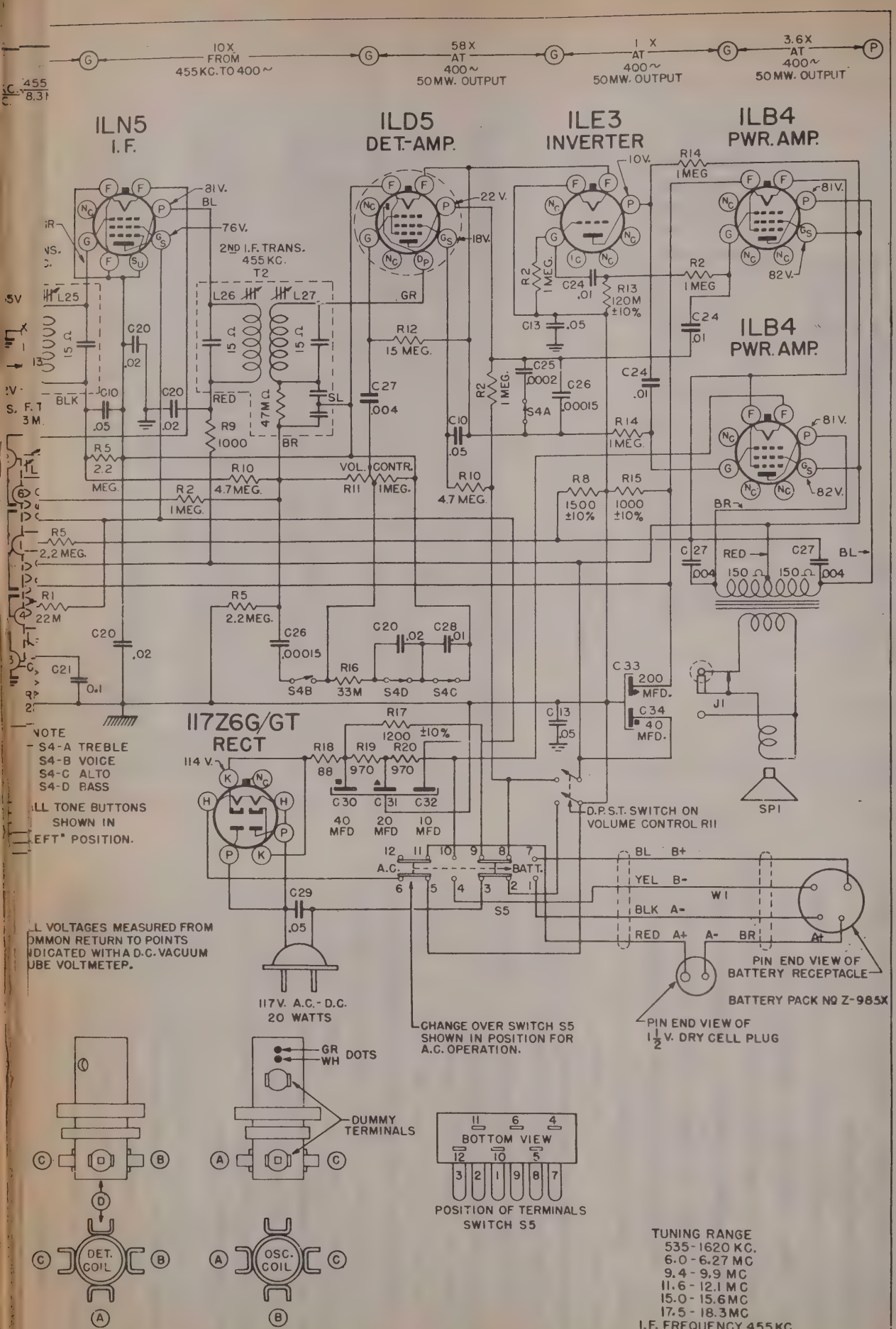
PART NO.	MISCELLANEOUS (CHASSIS) Cont'd	PRICE
78-598	Socket - Loktal (1LE3)	.18
78-625	Socket - Loktal (1LC6)	.18
78-626	Socket - Loktal (1LD5)	.18
85-332	Tone Control Switch (S4)	.75
85-333	Power Change - Over Switch (S5)	.82
126-379	Tube Shield	.07

FREQUENCY BAND SWITCH AND COIL ASSEM.

22-1390	500 Mmfd. (C7) ..... 600 V.	.26
22-1391	250 Mmfd. (C8) ..... 600 V.	.26
22-1392	25 Mmfd. (C15) ..... 500 V.	.33
22-1393	50 Mmfd. (C16) ..... 500 V.	.51
22-1394	62 Mmfd. (C17) ..... 500 V.	.33
22-1415	Ceramic Trimmer (C6)	.22
22-1437	.01 Mfd. (C28) ..... 200 V.	.20
24-356	Band Switch Cover	.17
63-591	22M Ohm (R1) ..... 1/4 Watt	.09
83-1073	Dual Pin Jack Terminal Strip	.18
85-334	Band Selector Switch (S3)	8.15
85-335	Antenna Switch	1.00
20S11212	16M Osc. Coil Assem. (Coil No. 1)	.53
20S11213	19M Osc. Coil Assem. (Coil No. 2)	.53
20S11214	25M Osc. Coil Assem. (Coil No. 3)	.53
20S11215	31M Osc. Coil Assem. (Coil No. 4)	.53
20S11216	49M Osc. Coil Assem. (Coil No. 5)	.53
20S11217	16M R.F. Coil Assem. (Coil No. 6)	.53
20S11218	19M R.F. Coil Assem. (Coil No. 7)	.53
20S11219	25M R.F. Coil Assem. (Coil No. 8)	.53
20S11220	31M R.F. Coil Assem. (Coil No. 9)	.53
20S11221	49M R.F. Coil Assem. (Coil No. 10)	.53
20S11222	16M Ant. Coil Assem. (Coil No. 11)	.53
20S11223	19M Ant. Coil Assem. (Coil No. 12)	.53
20S11224	25M Ant. Coil Assem. (Coil No. 13)	.53
20S11225	31M Ant. Coil Assem. (Coil No. 14)	.53
20S11226	49M Ant. Coil Assem. (Coil No. 15)	.53
S11227	Frequency Band Switch and Coil Assem. (Complete)	25.00
20S11591	Antenna Loading Coil Assem. (L19)	.28
12S11871	Switch Mtg. Bracket and Socket Assem.	.45

CABINET - WAVEMAGNET AND ANTENNA PARTS

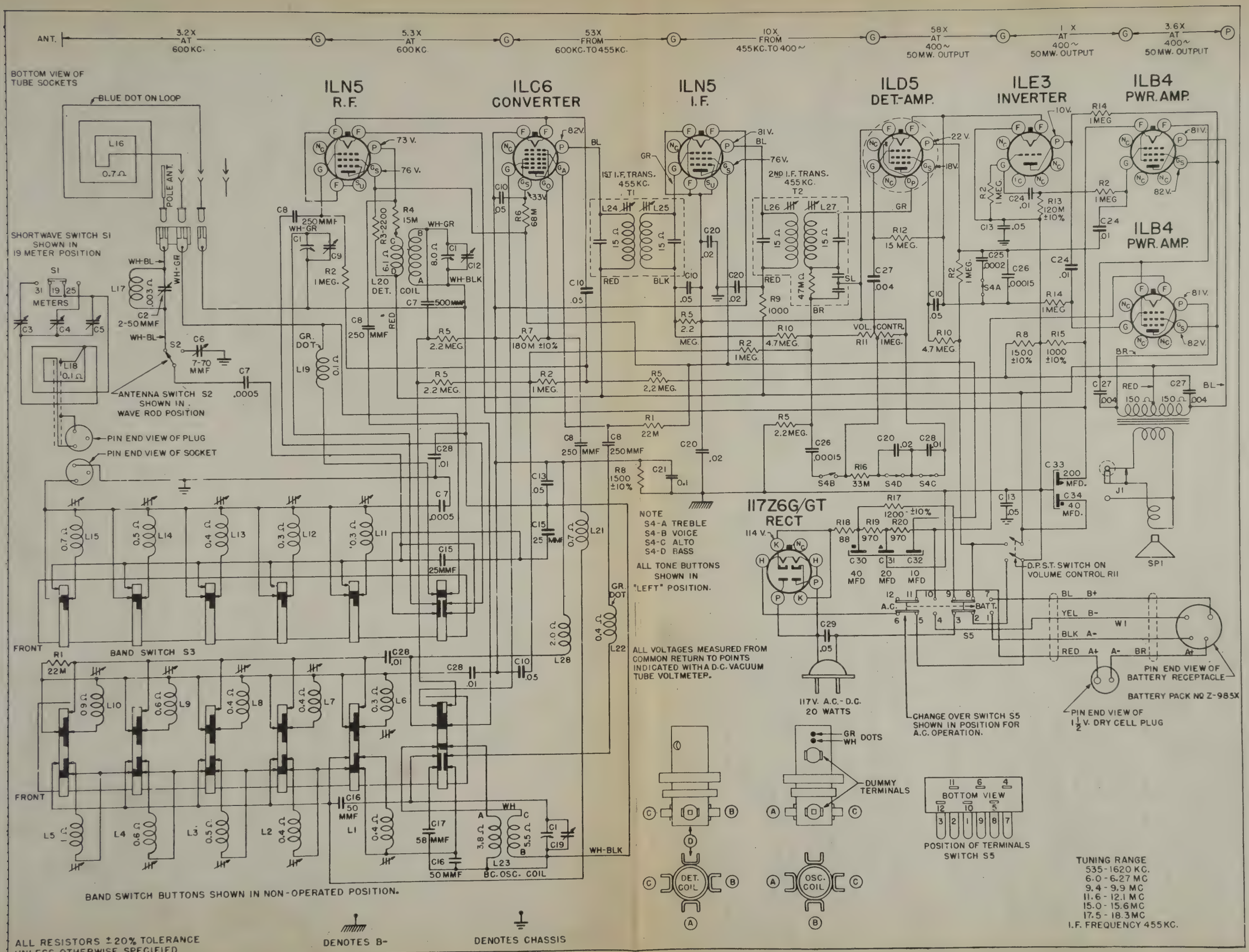
14-905	Model 005Y Cabinet (Less Esc. and Front Panel)	28.50
17-61	Shortwave Tube Retaining Clamp (2 Used)	.04
17-87	Telescopic Ant. Rod Retaining Clamp (1 Used)	.08
36-27	Cabinet Handle (Includes 36-28 Insert)	.64
40-29	Back Cover Hinge (2 Used)	.10
40S11247	Front Cover Hinge (Right)	.35
40S11249	Front Cover Hinge (Left)	.35
46-539	Band Sw. Knob (16M)	.10
46-540	Band Sw. Knob (19M)	.10
46-541	Band Sw. Knob (25M)	.10
46-542	Band Sw. Knob (31M)	.10
46-543	Band Sw. Knob (49M)	.10
46-544	Band Sw. Knob (BC)	.10
46-545	Telescopic Ant. Knob	.12
46-546	Tuning and Vol. Control Knob	.18
57-1052	Cabinet Front Panel	2.40
57-1053	Front Panel Escutcheon (Trans-Oceanic)	2.50
58-131	Three Prong Plug (S. W. Wavemagnet)	.05
83-1122	Push Button Felt Strip	.02
93-684	Black Felt Washer (Large) (For Vol. and Tun. Knobs)	.01
93-721	Black Felt Washer (Small) (For Vol. and Tun. Knobs)	.01
110-107	Grille Cloth	.15
114-197	# 10 x 3/4 Hex Washer Hd. Slotted S. T. Screw	.02
139-57	Baffle Board	.05
156-22	Door Latch - Upper Half	.87
156-23	Door Latch - Lower Half	.87
157-7	Strike Fastener - Rear Door (Male)	.08
157-12	Strike Fastener - Rear Door	.03
159-48	Snap Button (2 used) (Also used on S10862)	.02
159-49	Snap Button (2 used) (Also used on S10862 and S11246)	.01
188-47	Handle Ring (2 used)	.02
192-87	Dial Crystal	.42
202-372	Instruction and Log Book	.75
52S10862	Wavemagnet Cable Assem. (B. C.)	1.08
S10865	Wavemagnet Suction Cup Assem. (or S12528)	.14
S10867	Wavemagnet Snap Fastener (Front Cover) (Small)	.13
S12382	Wavemagnet Snap Fastener (Front Cover) (Large)	.33
S11246	Broadcast Wavemagnet Assem. (Type 27A) (L16)	3.43
S11251	Telescopic Antenna Assem. (Complete)	7.85
S11562	Short Wave Wavemagnet Assem. (L18)	2.71
S11586	Release Assem. for Telescopic Ant.	.50



MODEL 8G005
CHASSIS 8C40

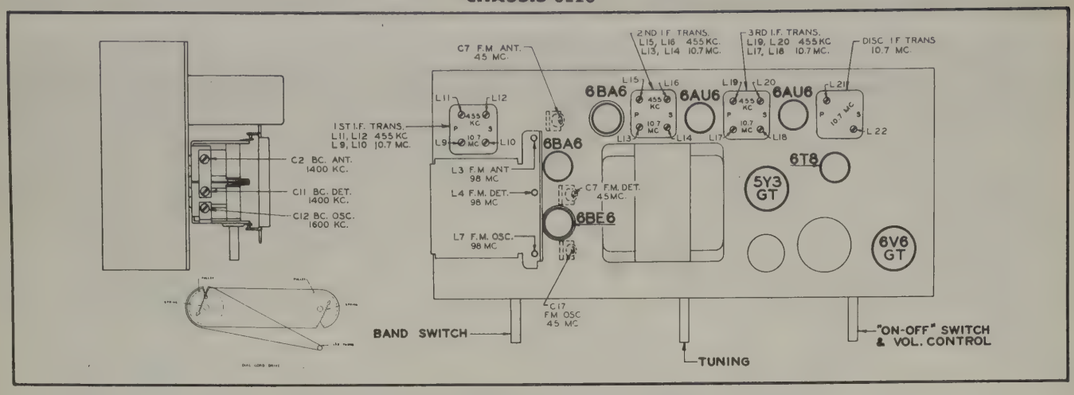
PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-396		Dial Scale	$0.95
59-209		Dial Pointer	.30
76-498		Pointer Shaft	.08
76-499		Tuning Control Shaft	.25
78-797		Dial Light Socket	.30
80-69		Dial Cord Tension Spring	.02
80-209		Dial Cord Tension Spring	.03
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-581		Tuner Arm Pressure Spring	.10
93-721		Black Felt Dial Washer	.01
100-36	PL-1	Dial Light Bulb Mazda #44	.09
149-64		Tuning Core & Spring	.40
188-32		Retaining Ring (76-499)	1.03C
S-14254		Pointer Pulley Assembly	.25
S-14256		Pulley & Bushing Assembly	.50
S-14268		Dial Cord & Eyelet Assembly (Short)	.05
S-14269		Dial Cord & Eyelet Assembly (Long)	.06
S-14270		Dial Scale & Strip Assembly (26-396)	1.15
S-14429		Tuner Arm Assembly	.80
		COILS AND CHOKES	
S-11157	L8	Broadcast Oscillator Coil Assembly	.53
S-12256	L24	A. C. Line Choke Coil Assembly	.35
S-12259	L7	F. M. Oscillator Coil Assembly	.33
S-13800	L23	Tone Choke Assembly	.60
S-13871	L4	F. M. Detector Coil Assembly	.75
S-13970	T1	1st. I. F. Transformer Assembly	2.50
S-13971	T2	2nd. I. F. Transformer Assembly	2.75
S-13972	T3	3rd. I. F. Transformer Assembly	3.00
S-13973	T4	Discriminator Transformer Assembly	2.00
S-13974	L6	Broadcast Detector Coil Assembly	1.00
S-14126	L5	R. F. Choke Coil Assembly	.35
S-14192	L3	F. M. Antenna Coil Assembly	.70
		CONDENSERS	
22-171	C26	.05 MFD. .600 V.	.26
22-196	C32	.01 MFD. .600 V.	.20
22-348	C15	.001 MFD .500 V.	.26
22-365	C24	100 MMFD. (or 22-1670) .500 V.	.20
22-829	C4	.05 MFD. .200 V.	.20
22-830	C21	.02 MFD. .600 V.	.20
22-1041	C38	.005 MFD .400 V.	.20
22-1136	C31	250 MMFD. (or 22-1745) .500 V.	.20
22-1220	C20	.002 MFD .600 V.	.20
22-1256	C28	75 MMFD. (or 22-1746) .500 V.	.20
22-1367	C14	50 MMFD. (Ceramic) .500 V.	.33
22-1385	C19	.01 MFD. .200 V.	.20
22-1506	C8	22 MMFD. (Ceramic) .500 V.	.33
22-1507	C22	25 MMFD. (Ceramic) .500 V.	.33
22-1531	C29	.2 MFD .200 V.	.20
22-1573	C34	40 MFD. Electrolytic .450 V.	2.25
22-1669	C3	100 MMFD (Ceramic) .500 V.	.20
22-1676	C6	.001 MFD (Ceramic) .500 V.	.40
22-1678	C1	Three Gang Variable	4.35
22-1685	C7	Single Section Trimmer	.45
22-1686	C17	Single Section Trimmer	.35
22-1688	C9	19 MMFD. (Ceramic) .500 V.	.30
22-1689	C13	48 MMFD. (Ceramic) .500 V.	.30
22-1691	C16	55 MMfD. (Silver on Ceramic)	.30
22-1705	C5	30 MMFD. (Ceramic) .500 V.	.20
22-1706	C10	.005 MMFD. (Ceramic) (Disc Type) .450 V.	.30
22-1717	C18	.001 MFD .200 V.	.20
22-1718	C27	.01 MFD. (Shielded) .400 V.	.40
22-1720	C35,36,37	Three Section Electrolytic 40 MFD.-25V x 40-40 MFD..450 V.	3.85
22-1754	C39	.0022 MFD. .600 V.	.26
		RESISTORS	
63-957	R4	33M Ohm (Insulated) .1 W.	.24
63-1369	R28	270 Ohm (Insulated) W. W .1 W.	.24
63-1566	R21	22M Ohm (Insulated) .2 W.	.33
63-1588	R30	Volume Control & switch	1.81
63-1589	R37,B8	Two Section Candohm	.60
63-1722	R33	33 Ohm (Insulated) ½ W.	.21
63-1737	R2	68 Ohm (Insulated) ½ W.	.21
63-1768	R34	390 Ohm (Insulated) ½ W.	.21
63-1771	R5	470 Ohm (Insulated) 10% ½ W.	.21
63-1772	R7	470 Ohm (Insulated) 20% ½ W.	.21
63-1778	R32	680 Ohm (Insulated) ½ W.	.21
63-1800	R10	2200 Ohm (Insulated) ½ W.	.21


ANT.
3.2X AT 600KC.
5.3X AT 600KC.
53X FROM 600KC. TO 455KC.
10X FROM 455KC. TO 400~
58X AT 400~ 50MW. OUTPUT
1 X AT 400~ 50MW. OUTPUT
3.6X AT 400~ 50MW. OUTPUT
BOTTOM VIEW OF TUBE SOCKETS
BLUE DOT ON LOOP
L16
0.7Ω
POLE ANT.
SHORTWAVE SWITCH S1 SHOWN IN 19 METER POSITION
S1
31 19 25
METERS
C3 C4 C5
L17 .003Ω
C2 2-50MMF
WH-BL
WH-GR
S2
C6 7-70 MMF
C7 .0005
L18 0.1Ω
ANTENNA SWITCH S2 SHOWN IN WAVE ROD POSITION
PIN END VIEW OF PLUG
PIN END VIEW OF SOCKET
ILN5 R.F.
ILC6 CONVERTER
ILN5 I.F.
ILD5 DET.-AMP.
ILE3 INVERTER
ILB4 PWR. AMP.
ILB4 PWR. AMP.
73 V.
76 V.
82V.
81V.
76V.
22 V.
18V.
10V.
81V.
82V.
81V.
82V.
C8 250 MMF
C1
C9
R2 1 MEG.
R3 2200
R4 15M
6.1Ω
8.0Ω
L20 DET. COIL
C1
C12
WH-BLK
C7 500MMF
C8 250 MMF
RED
GR. DOT
L19 0.1Ω
R5 2.2 MEG.
R7 180M ±10%
R2 1 MEG.
R5 2.2 MEG.
C10 .05
R6 68M
33V
1ST I.F. TRANS. 455KC. T1
L24 15Ω
L25 15Ω
RED
BLK
C10 .05
C20 .02
2ND I.F. TRANS. 455KC. T2
L26 15Ω
L27 15Ω
RED
R9 1000
47MΩ
SL
BR
R5 2.2 MEG.
R10 4.7 MEG.
R2 1 MEG.
VOL. CONTR. R11 1 MEG.
C27 .004
R12 15 MEG.
GR
C10 .05
R10 4.7 MEG.
R14 1 MEG
R2 1 MEG.
C24 .01
C13 .05
R13 120M ±10%
C25 .0002
C26 .00015
S4A
R2 1 MEG.
C24 .01
R14 1 MEG
R8 1500 ±10%
R15 1000 ±10%
BR
C27 .004
RED
150Ω
150Ω
C27 .004
BL
R1 22M
C8 250 MMF
C8 250MMF
R8 1500 ±10%
C21 0.1
C20 .02
R5 2.2MEG.
C26 .00015
S4B
R16 33M
S4D
C20 .02
C28 .01
S4C
C33 200 MFD.
C34 40 MFD.
J1
SP1
C28 .01
C7 .0005
C13 .05
C15 25 MMF
C15 25MMF
L21 0.7Ω
GR. DOT
0.4Ω
L22
2.0Ω
L28
C28 .01
C28 .01
C10 .05
R1 22M
L10 0.9Ω
L9 0.6Ω
L8 0.4Ω
L7 0.4Ω
L6 0.3Ω
C16 50 MMF
L1
0.4Ω
C17 58 MMF
C16 50MMF
WH
A
B
C
3.8Ω
5.5Ω
L23 BC. OSC. COIL
C1
C19
WH-BLK
L5 1Ω
L4 0.6Ω
L3 0.5Ω
L2 0.4Ω
FRONT
BAND SWITCH S3
FRONT
BAND SWITCH BUTTONS SHOWN IN NON-OPERATED POSITION.
L15 0.7Ω
L14 0.5Ω
L13 0.4Ω
L12 0.3Ω
L11 0.3Ω
NOTE
S4-A TREBLE
S4-B VOICE
S4-C ALTO
S4-D BASS
ALL TONE BUTTONS SHOWN IN "LEFT" POSITION.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.
117Z6G/GT RECT
114 V.
R17 1200 ±10%
R18 88
R19 970
R20 970
C30 40 MFD
C31 20 MFD
C32 10 MFD
C13 .05
D.P.S.T. SWITCH ON VOLUME CONTROL R11
12 11 10 9 8 7
A.C.
BATT.
6 5 4 3 2 1
S5
C29 .05
117V. A.C.-D.C. 20 WATTS
CHANGE OVER SWITCH S5 SHOWN IN POSITION FOR A.C. OPERATION.
BL B+
YEL B-
BLK A-
RED A+ A- BR A+
W1
PIN END VIEW OF BATTERY RECEPTACLE
BATTERY PACK NO Z-985X
PIN END VIEW OF 1½ V. DRY CELL PLUG
GR DOTS
WH DOTS
DUMMY TERMINALS
DET. COIL
OSC. COIL
BOTTOM VIEW
11 6 4
12 10 5
3 2 1 9 8 7
POSITION OF TERMINALS SWITCH S5
TUNING RANGE
535 - 1620 KC.
6.0 - 6.27 MC
9.4 - 9.9 MC
11.6 - 12.1 MC
15.0 - 15.6 MC
17.5 - 18.3 MC
I.F. FREQUENCY 455 KC.
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED
DENOTES B-
DENOTES CHASSIS

MODELS 8H832 and 8H861

CHASSIS 8E20


2ND I.F. TRANS. L15, L16 455 KC. L13, L14 10.7 MC.
3RD I.F. TRANS. L19, L20 455 KC. L17, L18 10.7 MC.
DISC. I.F. TRANS. 10.7 MC.
C7 F.M. ANT. 45 MC.
1ST I.F. TRANS. L11, L12 455 KC. L9, L10 10.7 MC.
C2 BC. ANT. 1400 KC.
C11 BC. DET. 1400 KC.
C12 BC. OSC. 1600 KC.
L3 F.M. ANT. 98 MC.
L4 F.M. DET. 98 MC.
L7 F.M. OSC. 98 MC.
C7 F.M. DET. 45 MC.
C17 F.M. OSC 45 MC.
6BA6
6AU6
6AU6
6BA6
6BE6
6T8
5Y3 GT
6V6 GT
BAND SWITCH
TUNING
"ON-OFF" SWITCH & VOL. CONTROL

TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 8E20 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

The Radiorgan tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms.. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alighment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1096. Be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 6BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L-11, 12, 15, 16, 19 and 20.	Align I. F. channel for maximum output
2	2 turns loosely cpld. to wavemagnet.		1600 Kc. Modulated	BC	1600 Kc.	C12	Set oscillator to dial scale.
3			1400 Kc. Modulated	BC	1400 Kc.	C11 and C2	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 6AU6 Limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 45		L21 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)		.05 Mfd.	10.7 Mc Unmodulated	FM 45		L22 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6AU6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L17 and L18 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BA6 1st IF.	.05 Mfd	10.7 Mc Unmodulated	FM 45		L13 and L14 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 6BE6 converter tube	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L9 and L10 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
9 (c)(d)	FM Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c)(d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 and L3 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.
11 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C17	Set oscillator to dial scale.
12 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C7 Det., C7 Ant.	Align detector and ant. stages for maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).

(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

RESISTORS

DESCRIPTION	REF. NO.	PART NO.	PRICE
33M Ohm (Insulated) 1 W	R4	63-957	.24
270 Ohm (Insulated) w. W	R28	63-1369	.24
22M Ohm (Insulated)	R21	63-1566	.33
Volume Control & switch	R30	63-1588	1.81
Two Section Candohm	R29, R8	63-1722	1.50
3 Ohm (Insulated)	R31	63-1737	.12
68 Ohm (Insulated)	R22	63-1767	.12
390 Ohm (Insulated)	R34	63-1768	.12
470 Ohm (Insulated) 10%	R5	63-1771	.12
470 Ohm (Insulated) 20%	R7	63-1772	.12
680 Ohm (Insulated)	R32	63-1778	.12
2200 Ohm (Insulated)	R10	63-1800	.12

CONDENSERS

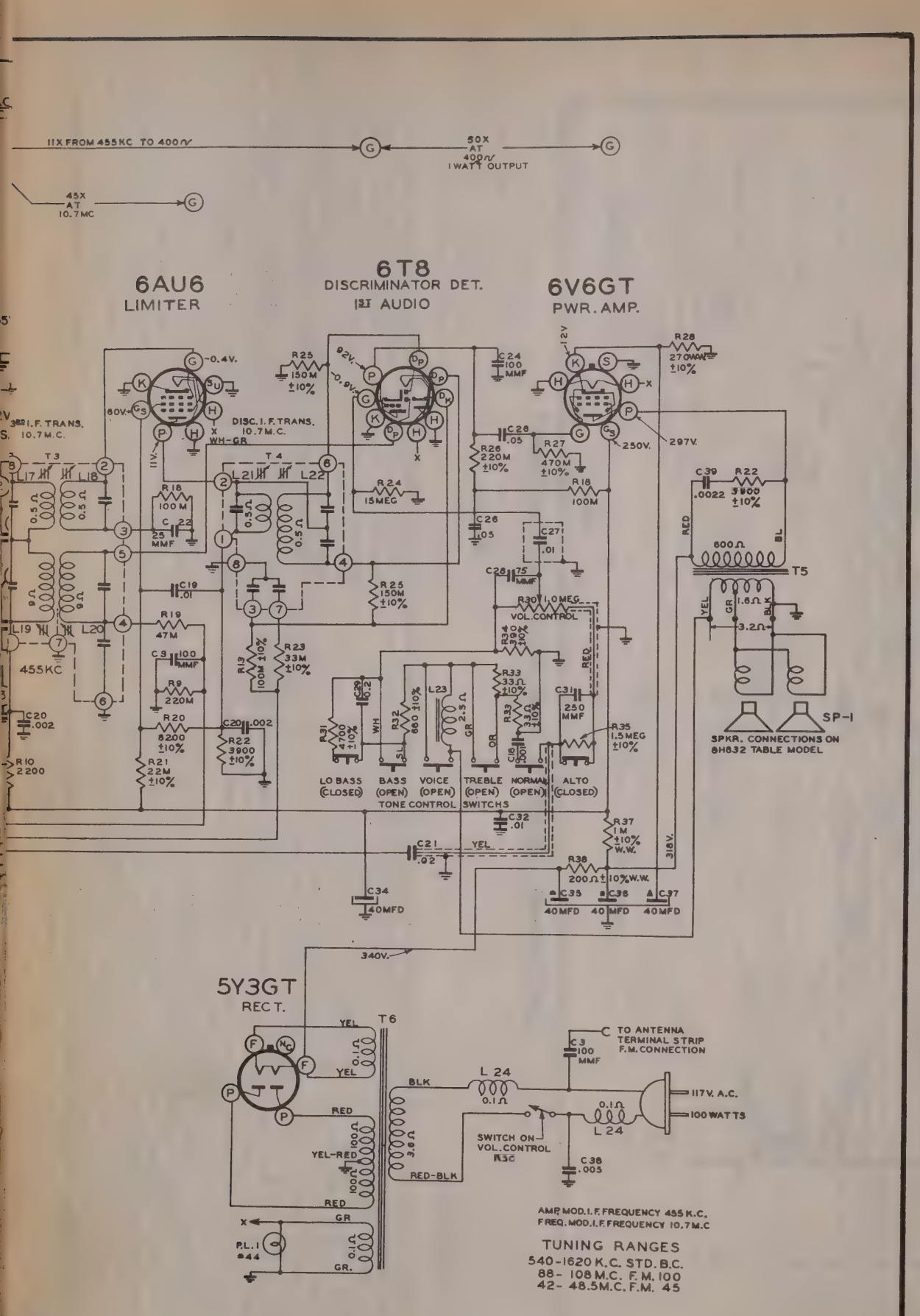
DESCRIPTION	REF. NO.	PART NO.	PRICE
.05 MFD. 600 V.	C22	22-196	.26
.01 MFD. 600 V.	C32	22-171	.26
.001 MFD. (or 22-1670) 600 V.	C15	22-348	.26
100 MMFD. (or 22-1670) 600 V.	C34	22-365	.26
.05 MFD. 200 V.	C21	22-830	.20
.02 MFD. 200 V.	C24	22-829	.20
.005 MFD. 200 V.	C38	22-1041	.20
.002 MFD. 200 V.	C30	22-1256	.20
250 MMFD. (or 22-1745) 500 V.	C35	22-1367	.20
75 MMFD. (or 22-1746) 500 V.	C14	22-1506	.20
.01 MFD. (Ceramic) 500 V.	C19	22-1385	.20
25 MMFD. (Ceramic) 500 V.	C8	22-1507	.20
25 MMFD. (Ceramic) 200 V.	C22	22-1531	.20
2 MFD. Electrolytic 450 V.	C29	22-1573	.33
40 MFD. Electrolytic 450 V.	C31	22-1659	2.25
100 MMFD. (Ceramic) 500 V.	C9	22-1676	.20
.001 MFD. (Ceramic) 500 V.	C6	22-1677	.20
Three Gang Variable	C17	22-1695	4.45
Single Section Trimmer	C7	22-1696	.45
19 MMFD. (Ceramic) 500 V.	C13	22-1698	.20
40 MMFD. (Ceramic) 500 V.	C16	22-1699	.20
55 MMFD. (Silver on Ceramic) 500 V.	C5	22-1705	.30
30 MMFD. (Ceramic) 500 V.	C10	22-1706	.30
.005 MFD. (Ceramic) (Disc Type) 500 V.	C33	22-1716	.30
.001 MFD. (Shielded) 200 V.	C18	22-1717	.20
.01 MFD. (Shielded) 200 V.	C25	22-1720	.20
Triple Section Electrolytic 40 MFD.-25V x 40-40 MFD. 450 V.	C39	22-1754	3.85
.0022 MFD. 1000 V.	C36, 37	22-1778	.26

COILS AND CHOKES

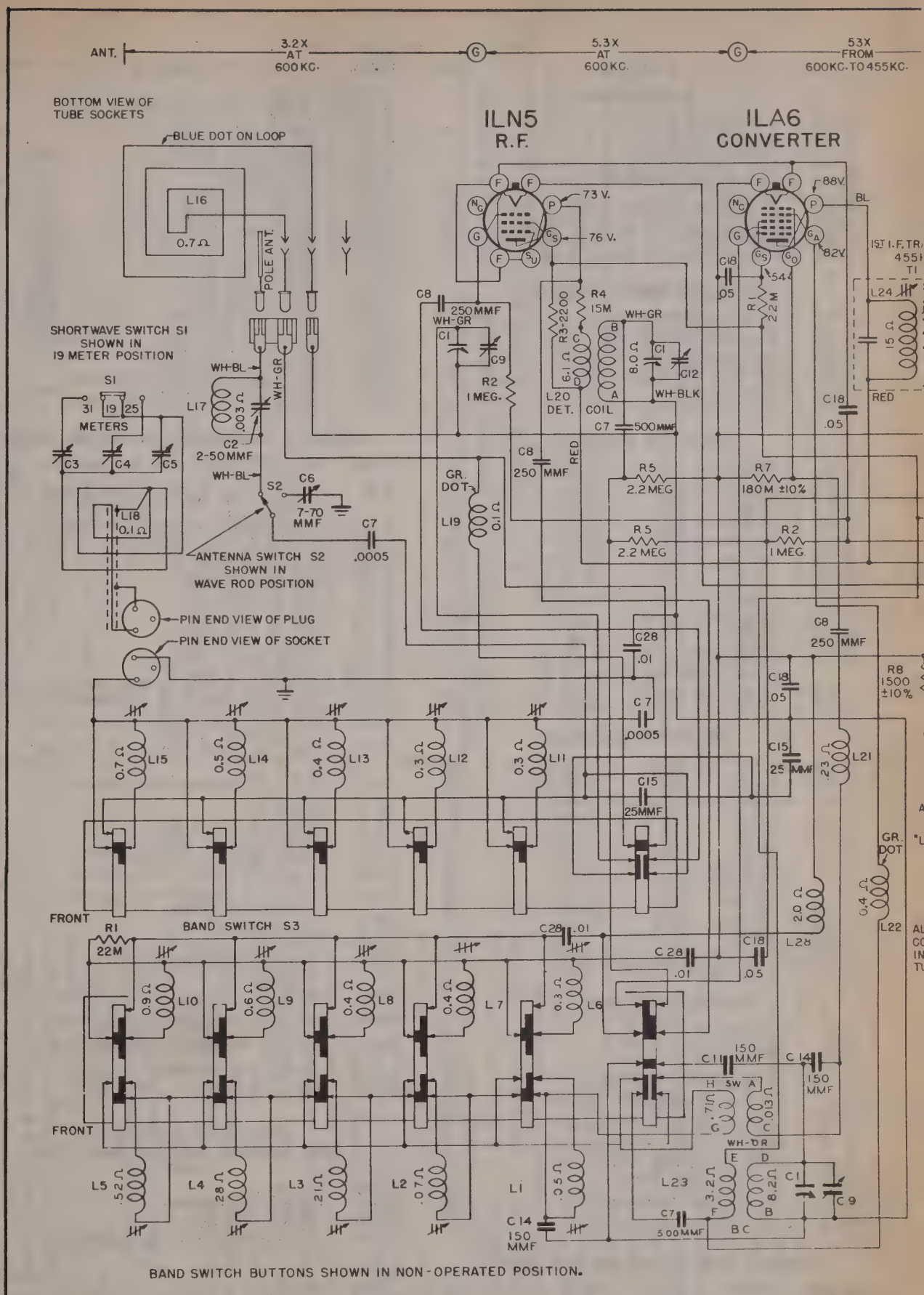
DESCRIPTION	REF. NO.	PART NO.	PRICE
Broadcast Oscillator Coil Assembly	L8	S-11157	.53
A. C. Line Choke Coil Assembly	L24	S-12256	.35
F. M. Oscillator Coil Assembly	L2	S-14259	.53
Fone Choke Assembly	L23	S-13931	.75
1st I. F. Transformer Assembly	L11	S-13970	2.50
2nd I. F. Transformer Assembly	L13	S-13971	2.75
3rd I. F. Transformer Assembly	L17	S-13972	3.00
Discriminator Transformer Assembly	T4	S-13973	2.00
Broadcast Detector Coil Assembly	L6	S-13974	1.00
R. F. Choke Coil Assembly	L5	S-14126	.35
F. M. Antenna Coil Assembly	L3	S-14192	.70

DIAL ASSEMBLY

DESCRIPTION	REF. NO.	PART NO.	PRICE
Dial Scale		26-396	$0.95
Dial Pointer		59-209	.30
Pointer Shaft		76-498	.08
Tuning Control Shaft		76-499	.25
Dial Light Socket		78-797	.08
Dial Cord Tension Spring		80-589	.03
Dial Cord Tension Spring		80-590	.03
Tuner Arm Stop Spring		80-591	.06
Tuner Arm Pressure Spring		80-592	.06
Black Felt Dial Washer		93-721	.10
Dial Light Bulb Mazda #44	PL-1	100-36	.01
Tuning Core & Spring		149-64	.09
Retaining Ring (76-499)		188-32	.01
Pointer Pulley Assembly		S-14254	1.03
Pulley & Bushing Assembly		S-14255	.40
Pointer Pulley Assembly (Short)		S-14268	.40
Dial Cord & Eyelet Assembly		S-14269	.25
Dial Scale & Eyelet Assembly (26-396)		S-14270	.95
Tuner Arm Assembly		S-14429	1.15
			.80



MODELS 8H832 and 8H861
CHASSIS 8E20



BAND SWITCH BUTTONS SHOWN IN NON-OPERATED POSITION.

ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED

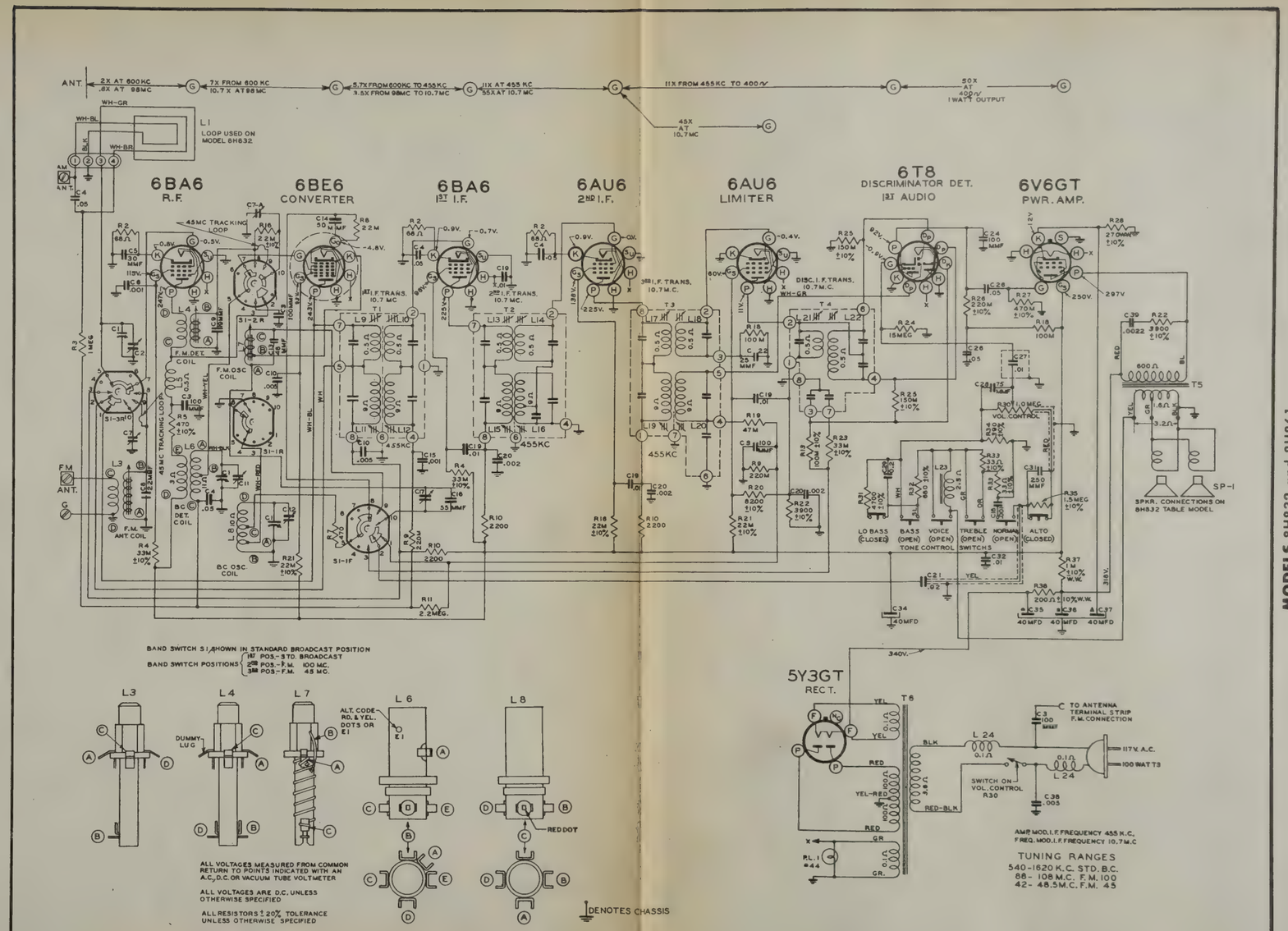
DENOTES B-

DENOTES CHASSIS

PART NO.	REF. NO.	DESCRIPTION	PRICE
		RESISTORS--Continued	
63-1810	R22	3900 Ohm . (Insulated) . . . . . ½ W.	$0.21
63-1813	R31	4700 Ohm . (Insulated) . . . . . ½ W.	.21
63-1824	R20	8200 Ohm . (Insulated) . . . . . ½ W.	.21
63-1841	R16	22K Ohm. . (Insulated) 10% . . . . . ½ W.	.21
63-1842	R8	22K Ohm. . (Insulated) 20% . . . . . ½ W.	.21
63-1848	R23	33K Ohm. . (Insulated) . . . . . ½ W.	.21
63-1856	R19	47K Ohm. . (Insulated) . . . . . ½ W.	.21
63-1869	R13	100K Ohm . (Insulated) 10% . . . . . ½ W.	.21
63-1870	R18	100K Ohm . (Insulated) 20% . . . . . ½ W.	.21
63-1876	R25	150K Ohm . (Insulated) . . . . . ½ W.	.21
63-1883	R26	220K Ohm . (Insulated) 10% . . . . . ½ W.	.21
63-1884	R9	220K Ohm . (Insulated) 20% . . . . . ½ W.	.21
63-1897	R28	470K Ohm . (Insulated) . . . . . ½ W.	.21
63-1912	R3	1 Megohm . (Insulated) . . . . . ½ W.	.21
63-1918	R35	1.5 Megohm (Insulated) . . . . . ½ W.	.21
63-1926	R11	2.2 Megohm (Insulated) . . . . . ½ W.	.21
63-1961	R24	15 Megohm . (Insulated) . . . . . ½ W.	.21
		MISCELLANEOUS	
2-134		Cabinet Back	.75
11-104		Line Cord & Plug (7 ft.)	.65
46-697		Volume & Tuning Control Knob (2 used).	.10
46-718		Bandswitch Knob.	.15
49-641	SP-1	5¼" P. M. Speaker (2 used)	6.00
		208-641 Cone & Voice Coil.	1.73
54-30		#8-32 x 5/16" Hex Nut - Steel - N.P. (4 used).	.31C
54-31		#10-32 x 3/8" x 1/8" Hex Nut (4 used on 95-1062)	.43C
54-139		#3/8-32 x 9/16" Palnut-Cads (used on 63-1588).	.01
54-226		Speed Nut (3 used)	.01
54-262		Speed Nut	.01
57-1353		Diffusing Plate.	.90
57-1386		Dial Escutcheon.	6.00
70-83		#6 x ½" Washer Hd. Wood Screw (8 used) (Cabt. Back Mtg.) . . .	.55C
72-58		#2 x 3/8" Phillips Flat Hd. Wood Screw (6 used) (Escutcheon Mtg.)	.02
78-250		Electrolytic Capacitor Socket.	.07
78-782		Miniature Tube Socket (2 used)	.25
78-788		Miniature Tube Socket (9 Contact).	.35
78-793		Octal Tube Socket (2 used)	.15
78-794		Miniature Tube Socket (3 used) (7 Contact)	.20
85-424	S1	Bandswitch	3.60
93-125		#6 Int. Lockwasher	.31C
93-127		#10 Int. Lockwasher (4 used on 95-1062).	.43C
93-392		3/32" x 33/64" x 1 Brown Felt Washer	1.20C
93-719		.031 x 3/16" x 7/16" Steel Washer.	.01
95-1062		Pwr. Transformer	13.00
95-1096		Output Transformer	2.50
112-56		#6 x 1/4" Hex. Hd. Self Tapping Screw.	.55C
112-142		#8-32 x 1-1/8" Swedged Hd. M.S. (4 used)	.02
114-43		#10-32 x 3/8" Hex. Washer Hd. M.S.-Steel-N.P	.72C
114-128		#10 x 1-1/16" Hex. Washer Hd. Self Tapping Screw (4 used). (Chassis Mtg.)	1.81C
114-159		#6 x 1/4" Hex. Hd. Self Tapping Screw-Type A-Cad. Pl.	.72C
114-270		#8 x 1/2" Hex. Hd. Slotted Self Tapping Screw.	.02
114-292		#6 x 5/8" Hex. Hd. Slotted Self Tapping Screw.	.01
125-62		Rubber Grommet (4 used).	.02
166-46		Rubber Bumper (4 used) (Rubber Feet)	.03
192-115		Dial Glass	1.50
196-109		Dial Dust Gasket	.75
202-506		F. M. Instruction Book	.10
202-610		Instruction Book	.10
S-14647	L1	Wavemagnet Assembly Type 29E	1.50
S-14648		Wavemagnet and Back Assembly	2.25
		RADIORGAN PARTS	
57-1351		Radiorgan Escutcheon (L.H.).	.50
57-1352		Radiorgan Escutcheon (R.H.).	.50
76-444		Radiorgan Knob Retaining Shaft (2 Used).	.04
80-595		Radiorgan Mounting Spring (2 Used)	.05
S-13800		Tone Choke Assembly.	.60
S-14255		Radiorgan Mounting Bracket Assembly (2 Used)	.15
S-14260		Radiorgan Strip and Contact Assembly (R.H.).	.15
S-14261		Radiorgan Strip and Contact Assembly (L.H.).	.15
S-14273		Radiorgan Knob and Eyelet Assembly (Lo-Bass)	.20
S-14274		Radiorgan Knob and Eyelet Assembly (Bass).	.20
S-14275		Radiorgan Knob and Eyelet Assembly (Voice)	.20
S-14276		Radiorgan Knob and Eyelet Assembly (Treble).	.20
S-14277		Radiorgan Knob and Eyelet Assembly (Alto).	.20
S-14278		Radiorgan Knob and Eyelet Assembly (Normal).	.20
S-14310		Radiorgan Escutcheon and Knob Assembly (L. H.) (Lo-Bass, Bass, Voice)	1.50
S-14311		Radiorgan Escutcheon and Knob Assembly (R.H.) (Treble, Alto, Normal).	1.50

25M-648-CPC

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



MODELS 8H832 and 8H861
CHASSIS 8E20

MODELS 8G005YT (Z1)—8G005YT (Z2)
CHASSIS 8C40T (Z1) — 8C40T (Z2)

TO THE SERVICE MAN:

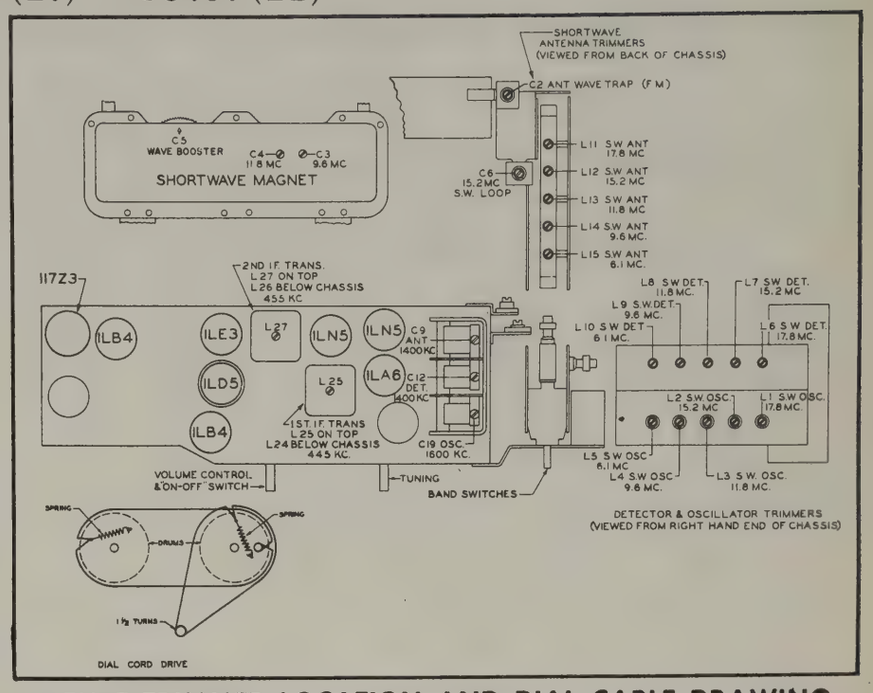
Chassis 8C40T (Z1) and 8C40T (Z2 Special Weather Band) feature a high gain tuned RF stage ahead of a conventional superheterodyne circuit with band spread tuning on the 49, 31, 25, 19, and 16 meter bands.

The audio amplifier used in these chassis features phase inversion and push-pull power output.

If removal of the chassis from the cabinet ever becomes necessary this should be done with care.

The alignment of these chassis is conventional. However, care must be exercised when making adjustments, and the alignment procedure must be followed exactly. Set the chassis over a metal plate approximately the same distance the battery pack is from the bottom of the chassis when it is in the cabinet. This procedure will introduce the approximate amount of metal in the field of the RF and oscillator coils as when the chassis is in the cabinet. A signal generator of reasonable accuracy and good attenuation must be used. An output meter (AC) of the copper oxide rectifier type with a range of 1 to 30 volts in several steps is necessary to get accurate output readings. Alignment wrenches should be of the non-metallic type, especially when making adjustments at the higher frequencies.

When reinstalling the chassis in the cabinet be careful not to disturb the cabling between the short wave coil assembly and chassis. Tune in a weak broadcast signal near 1400 Kc. and touch up trimmer C9. This will insure maximum performance after alignment.



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.1 mfd.	455 Kc.	BC	600 Kc.	L-24, 25, 26, 27	Align I. F.
2	One Turn Loop Coupled Loosely to Broadcast Wavemagnet		1600 Kc.	BC	1600 Kc.	C-19	Set Oscillator to Scale.
3			1400 Kc.	BC	1400 Kc.	C-12	Alignment of Detector Sec.
4			1400 Kc.	BC	1400 Kc.	C-9	Alignment of B. C. Wavemagnet
5*	For 8C40T (Z2)		6.1 Mc. 6.5 Mc.	49 Met. 49 Met.	6.1 Mc. 6.5 Mc.	L-5, L-10, L-15	Alignment of S.W. Antenna, Detector and Oscillator
6*	3 Feet of Wire Approx. 1 foot from Extended Waverod		9.6 Mc.	31 Met.	9.6 Mc.	L-4, L-9, L-14	
7*			11.8 Mc.	25 Met.	11.8 Mc.	L-3, L-8, L-13	
8*			15.2 Mc.	19 Met.	15.2 Mc.	L-2, L-7, L-12	
9*			17.8 Mc.	16 Met.	17.8 Mc.	L-1, L-6, L-11	
10	One Turn Loop Coupled Loosely to Shortwave Magnet, Waverod Collapsed.		15.2 Mc.	19 Met.	15.2 Mc.	C-5, C-6	Alignment of Shortwave Magnet.
11			11.8 Mc.	25 Met.	11.8 Mc.	C-4	
12			9.6 Mc.	31 Met.	9.6 Mc.	C-3	
13	When Receiving Normal Transmission on the 49, 31, 25, 18 or 16 Meter Bands, if FM Interference is Experienced Adjust Wave Trap Trimmer C-2 for Minimum Response of the Interferring Signal.						

* NOTE: Rock Tuning Condenser When Making Alignment Under Operations 5, 6, 7, 8 and 9.

PARTS LIST FOR 8C40T (Z1)

DIAL ASSEMBLY

PART NO.	DESCRIPTION	PRICE
26-398	Dial Scale	
59-155	Dial Pointer	.82
59-195	"On-off" Indicator	
76-415	Tuning Control Shaft	.15
80-69	Drive Cord Tension Spring	
80-553	Indicator Tension Spring	1.09C
188-32	Retaining Ring	.38
S11202	Drive Pulley and Rivet Assem. (on Gang)	.06
S11204	Dial Drive Cord and Eyelet Assem.	.05
S11205	Pointer Pulley Cord and Eyelet Assem.	.38
S11206	Pointer Drive Shaft and Pulley Assem.	.19
S11207	Indicator Lever and Bushing Assem.	

COILS AND CHOKES (CHASSIS)

95-912	1st I.F. Transformer (T1)	3.45
95-913	2nd I.F. Transformer (T2)	4.40
S11210	Detector Coil Assem. (L20)	1.40
S11404	Oscillator Coil Assem. (L23)	.20
S11821	Wave Trap Coil Assem. (L17)	.30
S11822	R.F. Choke Coil Assem. (L22)	
S14403	Choke Coil Assem. (L21)	.20
S11952	R.F. Shunt Coil Assem. (L28)	

CONDENSERS (CHASSIS)

22-147	500 Mmfd. (C22) . . . .600 V.	.26
22-470	150 Mmfd. (C26) . . . .600 V.	.20
22-805	.004 Mfd. (C27) . . . .600 V.	.20
22-811	.01 Mfd. (C24) . . . .200 V.	.20
22-813	.02 Mfd. (C20) . . . .200 V.	.20
22-817	.05 Mfd. (C10) . . . .400 V.	.20
22-818	.05 Mfd. (C29) . . . .400 V.	.20
22-820	.1 Mfd. (C21) . . . .200 V.	.23
22-953	.0002 Mfd. (C25) . . . .600 V.	.16
22/1063	.001 Mfd. (C23) . . . .600 V.	.20
22-1234	Dry Electrolytic - 40 Mfd. - 150 V. x 200 Mfd. - 10 V. (C33 and C34)	1.92
22-1373	Three Gange Variable (C1)	5.00
22-1390	500 Mmfd. (C7) . . . .600 V.	.26
22-1391	250 Mmfd. (C8) . . . .600 V.	.26
22-1425	Ceramic Trimmer (Wave Trap) (C2)	.27
22-1426	Dry Electrolytic - 40 x 20 x 10 Mfd. - 150 V. (C30, C31 and C42)	1.60
22-1430	.05 Mfd. (C13) . . . .200 V.	.20
22-1437	.01 Mfd. (C28) . . . .200 V.	.20

RESISTORS (CHASSIS)

63-238	1M Ohm	(R15) . . . .1/4 Watt	.09
63-245	1500 Ohm	(R8) . . . .1/4 Watt	.09
63-271	1 Megohm	(R2) . . . .1/4 Watt	.09
63-283	1M Ohm	(R9) . . . .1/4 Watt	.09
63-585	2200 Ohm	(R3) . . . .1/4 Watt	.09
63-590	15M Ohm	(R4) . . . .1/4 Watt	.09
63-591	22M Ohm	(R11) . . . .1/4 Watt	.09
63-592	33M Ohm	(R16) . . . .1/4 Watt	.09
63-602	2.2 Megohm	(R10) . . . .1/4 Watt	.09
63-654	180M Ohm	(R7) . . . .1/4 Watt	.09
63-771	120M Ohm	(R13) . . . .1/4 Watt (Insl.)	.19
63-1042	1 Megohm	(R14) . . . .1/4 Watt (Insl.)	.19
63-1093	15 Megohm	(R12) . . . .1/4 Watt	.21
63-1226	1220 Ohm	(R17) . . . .1/2 Watt	.63
63-1343	Candohm (or 63-1359)	(R19 and R20)	1.81
63-1344	Volume Control and Switch	(R11)	
63-1567	56 Ohm W.W.		

MISCELLANEOUS (CHASSIS)

11-104	Line Cord and Plug	
15-51	Battery Cable Plug Cap	.24
44-17	Phono Jack (J1)	9.00
49-517	5" P.M. Speaker	1.97
	206-517 Output Transformer	1.73
73-8	208-517 Cone and Voice Coil	
78-229	Set Screw (Gang Drive Pulley)	.03
78-543	Socket Electrolytic (4 Contact)	
78-556	Socket Wavemagnet Plug	
78-803	Socket Loctal Tube (3 Used)	
78-804	Socket Loctal Tube (2 Used)	
78-781	Socket Miniature Tube	
85-332	Tone Switch (S4)	.75
85-333	Power Change - Over Switch (S5)	.82
126-379	Tube Shield	.07
S14181	Adaptor Plate and Socket Assem.	

FREQUENCY BAND SWITCH AND COIL ASSEM.

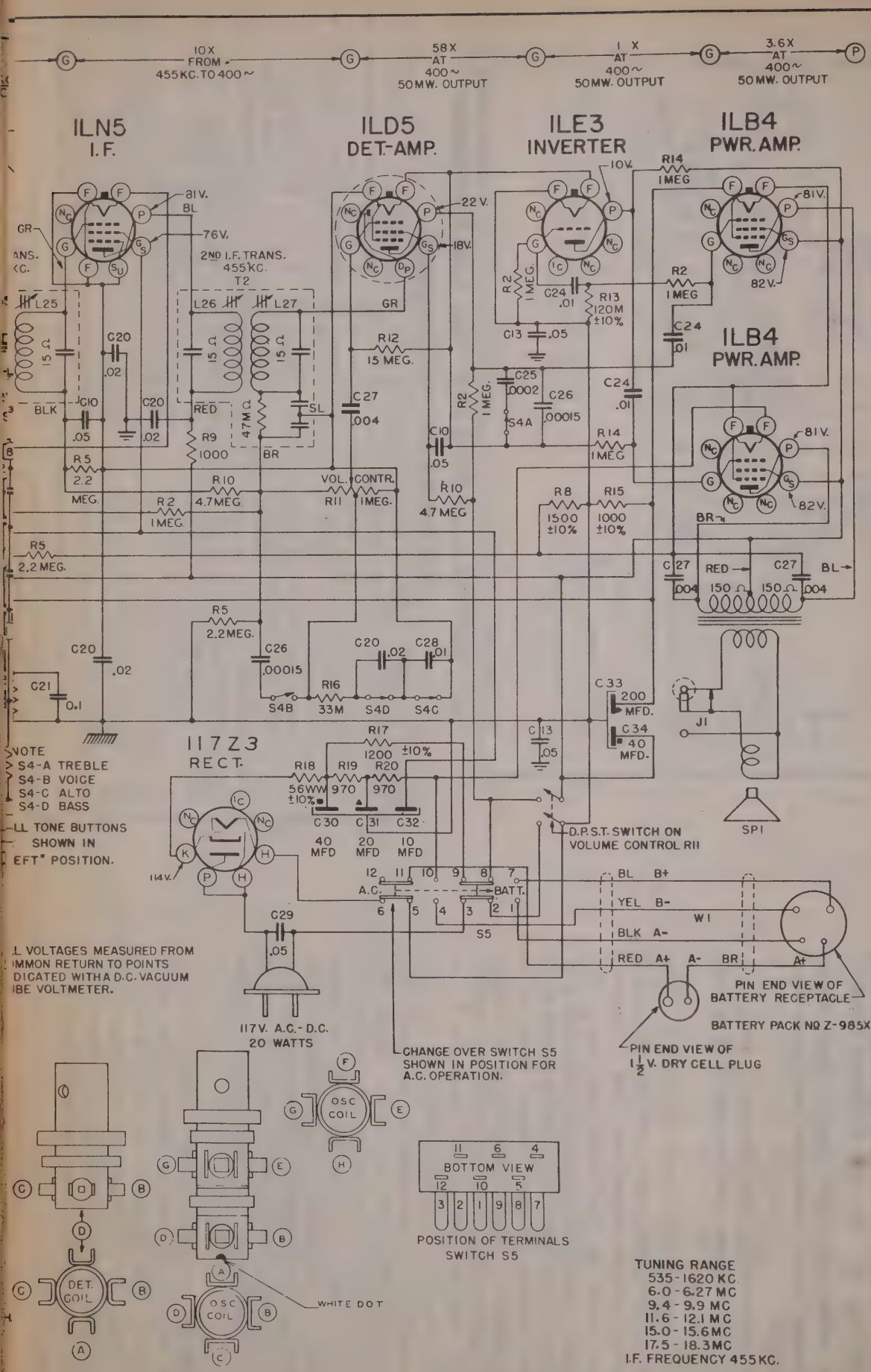
22-1389	500 Mmfd. (C7) . . . .600 V.	.26
22-1391	250 Mmfd. (C8) . . . .600 V.	.26
22-1392	25 Mmfd. (C15) . . . .500 V.	.33
22-1415	Ceramic Trimmer (C6) . . . .200 V.	.22
22-1437	.01 Mfd. (C28) . . . .200 V.	.20
22-1329	Short Wave Antenna Trimmer	

CABINET - WAVEMAGNET AND ANTENNA PARTS

PART NO.	DESCRIPTION	PRICE
14-905	Model 005Y Cabinet (Less Esc. and Front Panel)	28.50
17-61	Shortwave Tube Retaining Clamp (2 Used)	.04
17-67	Telescopic Ant. Rod Retaining Clamp (1 Used)	
36-27	Cabinet Handle (Includes 36-28 Insert)	.08
40-29	Back Cover Hinge (2 Used)	.64
S11247	Front Cover Hinge (Right)	.10
S11248	Front Cover Hinge (Left)	.35
46-539	Band Sw. Knob (16M)	.10
46-540	Band Sw. Knob (19M)	.10
46-541	Band Sw. Knob (25M)	.10
46-542	Band Sw. Knob (31M)	.10
46-543	Band Sw. Knob (49M)	.10
46-544	Band Sw. Knob (BC)	.10
46-545	Telescopic Ant Knob	.12
46-546	Tuning and Vol. Control Knob	.18
57-1052	Cabinet Front Panel	2.40
57-1053	Front Panel Escutcheon (Trans-Oceanic)	2.50
58-131	Three Prong Plug (S. W. Wavemagnet)	.05
83-1122	Push Button Felt Strip	.02
93-684	Black Felt Washer (Large) (For Vol. and Tun. Knobs)	.01
93-721	Black Felt Washer (Small) (For Vol. and Grille Cloth Knobs)	.01
110-107	# 10 x 3/4 Hex Washer Hd. Slotted S. T. Screw	.15
114-197	Baffle Board	.02
139-57	Door Latch - Upper Half	.05
156-22	Door Latch - Lower Half	.87
156-23	Strike Fastener - Rear Door (Male)	.87
157-7	Strike Fastener - Rear Door (Female)	.08
157-12	Snap Button (2 Used) (Also used on S10862)	.03
159-48	Snap Button (2 Used) (Also used on S10862 and S1246)	.02
159-49	Handle Ring (2 Used)	.01
188-47	Dial Crystal	.02
192-87	Instruction and Log Book (B. C.)	.42
202-579	Wavemagnet Cable Assem. (B. C.)	.75
S10862	Wavemagnet Suction Cup Assem. (or S12528)	1.08
S10865	Wavemagnet Snap Fastener (Front Cover) (Small)	.14
S10867	Wavemagnet Snap Fastener (Front Cover) (Large)	.13
S12382	Broadcast Wavemagnet Assem. (Type 27A)	.01
S11246	Telescopic Antenna Assem. (Complete)	.33
S11251	Short Wave Wavemagnet Assem. (L18)	3.43
S11562	Release Assem. for Telescopic Ant	7.85
S11586		2.71
		.50

PARTS LIST 8C40T (Z2) SAME AS PARTS LIST FOR 8C40T (Z1) EXCEPT:

OMIT		
26-398	Dial Scale	
S14119	49M R.F. Coil Assembly	
S14124	49M Ant. Coil Assem	
S14402	49M Osc. Coil Assem	
S14405	Frequency Band Switch and Coil Assembly	
ADD		
26-400	Dial Scale	
202-609	Instruction Book Supplement	
S14599	Frequency Band Switch and Coil Assembly	
S14601	Osc. Coil Assem	
S14602	R.F. Coil Assem	
S14603	Antenna Coil Assem	

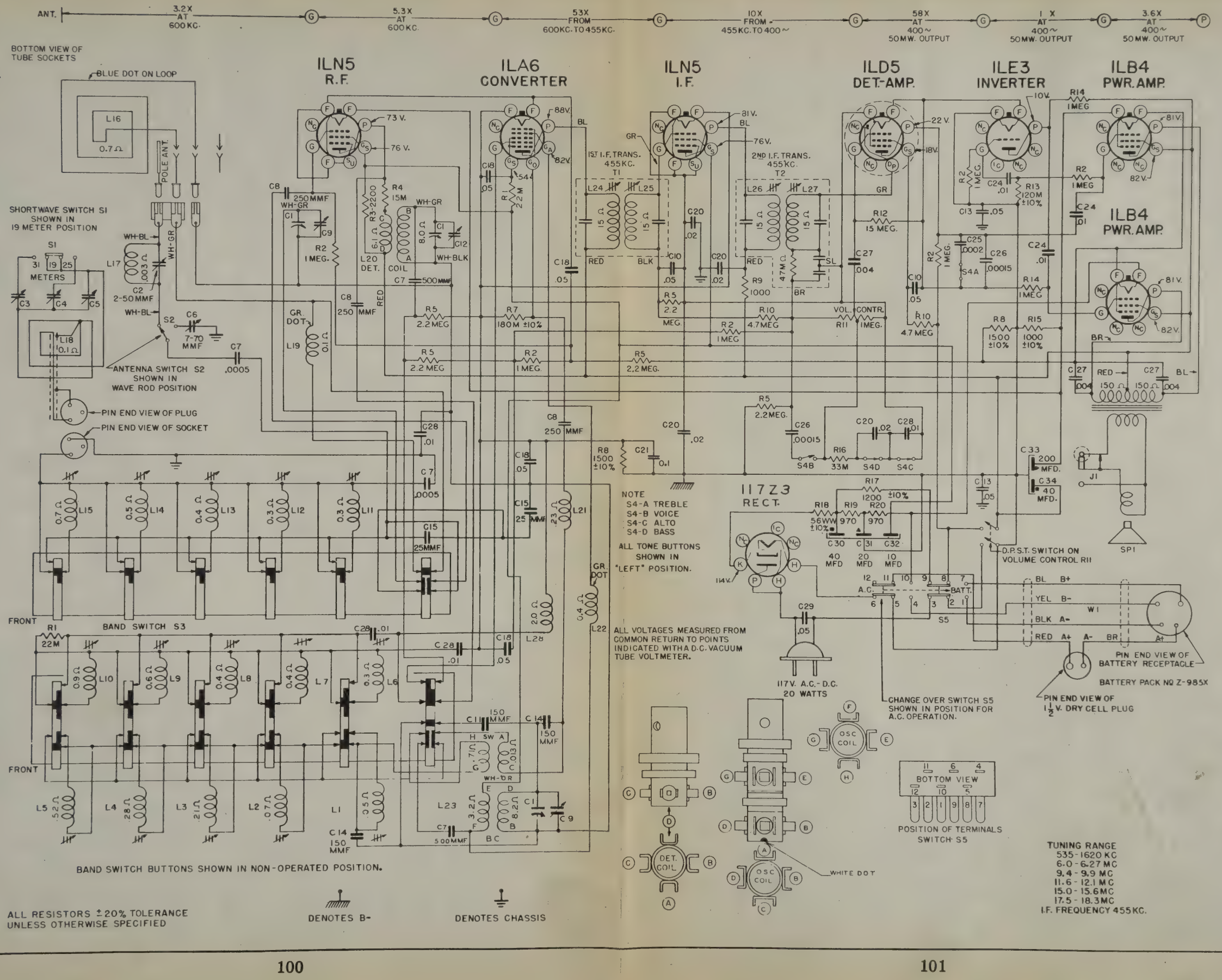

10X FROM 455KC. TO 400~
58X AT 400~ 50MW. OUTPUT
1 X AT 400~ 50MW. OUTPUT
3.6X AT 400~ 50MW. OUTPUT
ILN5 I.F.
ILD5 DET.-AMP.
ILE3 INVERTER
ILB4 PWR. AMP.
ILB4 PWR. AMP.
2ND I.F. TRANS. 455KC. T2
117Z3 RECT.
117V. A.C.-D.C. 20 WATTS
CHANGE OVER SWITCH S5 SHOWN IN POSITION FOR A.C. OPERATION.
D.P.S.T. SWITCH ON VOLUME CONTROL R11
PIN END VIEW OF BATTERY RECEPTACLE
BATTERY PACK NO Z-985X
PIN END VIEW OF 1½ V. DRY CELL PLUG
POSITION OF TERMINALS SWITCH S5
WHITE DOT
TUNING RANGE
535-1620 KC.
6.0-6.27 MC
9.4-9.9 MC
11.6-12.1 MC
15.0-15.6 MC
17.5-18.3 MC
I.F. FREQUENCY 455 KC.
NOTE
S4-A TREBLE
S4-B VOICE
S4-C ALTO
S4-D BASS
ALL TONE BUTTONS SHOWN IN "EFT" POSITION.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.

MODELS 8G005YT (Z1) — 8G005YT (Z2)
CHASSIS 8C40T (Z1) — 8C40T (Z2)

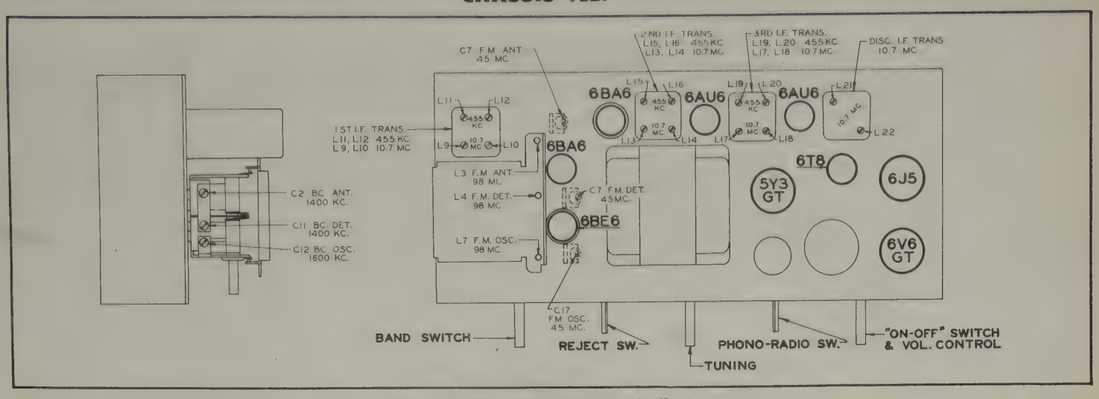
PARTS LIST

PART NUMBER	REF. NUMBER	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
12-1434		Dial Light Mounting Bracket	
26-396		Dial Scale (use S-14270)	
59-209		Dial Pointer	
76-499		Tuning Control Shaft	
78-797		Dial Light Socket	
80-69		Dial Cord Tension Spring	$0.02
80-209		Dial Cord Tension Spring	.03
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-581		Tuner Arm Pressure Spring	.10
100-36		Dial Light Bulb-Mazda 44	.09
188-32		Retaining Ring (76-499)	1.03c
196-109		Dial Dust Gasket	
S14254		Pointer Pulley Assembly	
S14256		Cam Pulley and Bushing Assembly (Gang Cond)	
S14268		Dial Cord & Eyelet Assembly (Short)	
S14269		Dial Cord & Eyelet Assembly (Long)	
S14270		Dial Scale and Strip Assembly (26-396)	
S14429		Tuner Arm Assembly	
		COILS AND CHOKES	
S11157	L8	Broadcast Oscillator Coil Assembly	.53
S12256	L24	A.C. Line Choke Coil Assembly	.35
S12259	L7	F.M. Oscillator Coil Assembly	.33
S12603	L25	Phono Oscillator Coil Assembly	2.02
S13800	L23	Tone Choke Assembly	
S13871	L4	F.M. Detector Coil Assembly	
S13970	T1	1st I.F. Transformer Assembly	
S13971	T2	2nd I.F. Transformer Assembly	
S13972	T3	3rd I.F. Transformer Assembly	
S13973	T4	Discriminator Transformer Assembly	
S13974	L6	Broadcast Detector Coil Assembly	
S14126	L5	R.F. Choke Coil Assembly	
S14192	L3	F.M. Antenna Coil Assembly	
		CONDENSERS	
22-171	C26	.05MFD	.26
22-196	C32	.01MFD 600V.	.20
22-348	C15	.001MFD. (Mica) 500V.	.26
22-365	C24	100MMFD. (or 22-1670) 500V.	.20
22-829	C4	.05MFD 200V.	.20
22-830	C21	.02MFD 600V.	.20
22-1041	C42	.005MFD. 400V.	.20
22-1136	C31	250MMFD. (or 22-1745) 500V.	.20
22-1220	C20	.002MFD. 600V.	.20
22-1256	C28	75MMFD. (or 22-1746) 500V.	.20
22-1367	C14	50MMFD. (Ceramic) 500V.	.33
22-1385	C19	.01MFD 200V.	.20
22-1418	C38	.1MFD. 200V.	
22-1489	C30	10MMFD (Ceramic) 500V.	
22-1506	C8	22MMFD. (Ceramic) 500V.	.33
22-1507	C22	25MMFD. (Ceramic) 500V.	.33
22-1531	C29	.2MFD. 200V.	.20
22-1532	C40	50MMFD (or 22-1674) 500V.	.20
22-1664	C39	50MMFD. (Ceramic) 500V.	
22-1669	C3	100MMFD. (Ceramic) 500V.	.20
22-1676	C6	.001MFD. (Ceramic) 500V.	.40
22-1678	C1	Three Gang Variable	
22-1685	C7	Single Section Trimmer	.45
22-1686	C17	Single Section Trimmer	.35
22-1688	C9	19MMFD. (Ceramic) 500V.	.30
22-1689	C13	48MMFD. (Ceramic) 500V.	.30
22-1691	C16	55MMFD. (Silver on Ceramic)	.30
22-1705	C5	30MMFD. (Ceramic) 500V.	.20
22-1706	C10	.005MFD. (Ceramic Disc Type) 450V.	.30
22-1717	C18	.001MFD. 200V.	
22-1718	C27	.01MFD. (Shielded) 400V.	
22-1719	C33,C34	Two Section Electrolytic 15-40MFD 450V.	
22-1720	C35,C36 C37	Three Section Electrolytic 40MFD.-25V.x40-40MFD.-450. 450V.	
22-1754	C43	.0022MFD 600V.	
		RESISTORS	
63-957	R4	33M ohm (Insulated) .1 W.	.24
63-1065	R6	15M ohm (Insulated) .1 W.	.24
63-1369	R28	270 ohm (Insulated-WW) .1 W.	.24
63-1565	R36	4700 ohm (Insulated) .1 W.	
63-1566	R21	22M ohm (Insulated) .2 W.	
63-1588	R30	Volume Control and Switch	
63-1589	R37,R38	Two Section Candohm (1000 ohm WW 5W., 200 ohm WW 3W) .1/2 W.	
63-1722	R33	33 ohm (Insulated) .1/2 W.	
63-1737	R2	68 ohm (Insulated) .1/2 W.	
63-1768	R34	390 ohm (Insulated) .1/2 W.	
63-1771	R5	470 ohm (Insulated) .1/2 W	.21
63-1772	R7	470 ohm (Insulated) .1/2 W.	.21
63-1778	R32	680 ohm (Insulated) .1/2 W	
63-1779	R12	680 ohm (Insulated) .1/2 W.	.21
63-1800	R10	2200 ohm (Insulated) .1/2 W	.21
63-1810	R22	3900 ohm (Insulated) .1/2 W	.21
63-1813	R31	4700 ohm (Insulated) .1/2 W	
63-1824	R20	8200 ohm (Insulated) .1/2 W.	.21
63-1827	R14	10M ohm (Insulated) .1/2 W.	
63-1841	R16	22M ohm (Insulated) .1/2 W.	.21
63-1842	R8	22M ohm (Insulated) .1/2 W.	
63-1848	R23	33M ohm (Insulated) .1/2 W.	.21
63-1856	R19	47M ohm (Insulated) .1/2 W.	.21
63-1869	R13	100M ohm (Insulated) .1/2 W.	
63-1870	R18	100M ohm (Insulated) .1/2 W.	.21
63-1876	R25	150M ohm (Insulated) .1/2 W.	.21
63-1883	R26	220M ohm (Insulated) .1/2 W.	.21
63-1884	R9	220M ohm (Insulated) .1/2 W.	.21
63-1897	R27	470M ohm (Insulated) .1/2 W.	
63-1911	R17	1 Megohm (Insulated) .1/2 W.	.21
63-1912	R3	1 Megohm (Insulated) .1/2 W.	.21
63-1918	R35	15 Megohm (Insulated) .1/2 W.	
63-1926	R11	2.2 Megohm (Insulated) .1/2 W.	.21
63-1961	R24	15 Megohm (Insulated) .1/2 W.	.21
		MISCELLANEOUS	
11-106		Line Cord and Plug (9 ft. long) (or 11-101)	
54-226		Speed Nut-Tinnerman	$0.01
78-709		Socket-Octal Tube	
78-782		Socket-Miniature Tube (2 used)	.25
78-788		Socket-Noval Miniature (9 contact)	.35
78-791		Socket-Phono Cable (7 contact)	
78-793		Socket-Octal Tube (2 used)	
78-794		Socket-Miniature Tube (7 contact)	.20
85-421	S2	Phono-Radio Switch	.90
85-422	S3	Phono-Reject Switch	.40
85-424	S1	Band Switch	
94-295		Phono Switch Mounting Bushing	.04
94-598		R.F. Plate Mounting Bushing (4 used)	.01
95-1062	T6	Power Transformer	
95-1063	T5	Output Transformer	
125-17		Rubber Grommet (2 used (1 on 85-421) (1 on 85-422)	.03
125-62		Rubber Grommet (4 used)	.02
126-553		Miniature Tube Shield (Metal)	.11
126-554		Miniature Tube Shield (Paper)	.10
126-569		Heat Shield	
149-64		Tuning Core and Spring (3 used)	.40
		RADIORGAN ESCUTCHEON PARTS	
57-1351		Radiorgan Escutcheon (L.H.)	
57-1352		Radiorgan Escutcheon (R.H.)	
76-444		Radiorgan Knob Retaining Shaft (2 used)	.04
80-595		Radiorgan Mounting Spring (2 used)	
114-159		#6x1/4 Hex.Hd. Self Tapping Screw (2 used)	.72c
S14255		Radiorgan Mounting Bracket Assembly (2 used)	
S14260		Radiorgan Strip and Contact Assembly (R.H.)	
S14261		Radiorgan Strip and Contact Assembly (L.H.)	
S14274		Radiorgan Knob and Eyelet Assembly (Bass)	
S14273		Radiorgan Knob and Eyelet Assembly (Lo-Bass)	
S14275		Radiorgan Knob and Eyelet Assembly (Voice)	
S14276		Radiorgan Knob and Eyelet Assembly (Treble)	
S14277		Radiorgan Knob and Eyelet Assembly (Alto)	
S14278		Radiorgan Knob and Eyelet Assembly (Normal)	
S14310		Radiorgan Escutcheon & Knob Assembly (L.H.) (Lo-Bass--Bass-Voice)	
S14311		Radiogran Escutcheon and Knob Assembly (R.H.) (Treble-Alto-Normal)	
		MODEL 9H881 CABINET PARTS	
15-82		Plug Cap and Insulator (used on S14353)	
19-123		Record Changer Mounting Clip (3 used)	.10
27-81		Shaft Bearing Disc	.05
36-39		Record Changer Frame Handle	
40-43		Cabinet Hinge (R.H.)	.30
40-44		Cabinet Hinge (L.H.)	.30
46-648		Door Pull (2 used)	.55
46-697		Volume and Tuning Control Knob (2 used)	
46-718		Band Switch Knob	.15
46-726		Phono Switch Knob	
49-624		12" P.M. Speaker 208-624 Cone and Voice Coil	
57-1336		Dial Escutcheon	
57-1353		Diffusing Plate	
58-169		Seven Prong Plug (used on S-14353)	
72-58		#2 x 3/8 Phillips Flat Hd. Wood Screw-Steel Brass Plate (Esc.Mtg.)	.02
78-798		Seven Contact Socket (used on S-14353)	
80-463		Record Changer Mounting Spring (4 used)	.03
83-1244		Record Changer Trim Strip	1.00
93-392		3/32 x 33/64" Brown Felt Washer (3 used)	1.20c
112-489		#8 x 1/2" Phillips R.H. Self Tapping Screw-cad. (Handle Mtg. Screw)	.03
112-682		Record changer Mounting Screw (4 used)	.06

MODELS 8G005YT (Z1) — 8G005YT (Z2)
CHASSIS 8C40T (Z1) — 8C40T (Z2)



MODELS 9H881, 9H882R, 9H885 and 9H888R
CHASSIS 9E21



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 9E21 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

The Radiorgan tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

The 6BA6 1st IF tube is also the phono pre-amplifier. The output from the phono oscillator is fed to the grid of the 6BA6 through C21 and R14. The amplified output is taken from the screen grid and fed back through R12 and C20 into the volume control circuit and the grid of the 6T8 1st audio amplifier.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

NOTE: The output transformer must be replaced with an exact duplicate, Part No.95-1063. Be sure to add the speaker code letter to the tranformer Part Number when ordering replacements.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 6BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L-11, 12, 15, 16, 19 and 20.	Align I. F. channel for maximum output
2	2 turns loosely cpld. to wavemagnet.		1600 Kc. Modulated	BC	1600 Kc.	C12	Set oscillator to dial scale.
3			1400 Kc. Modulated	BC	1400 Kc.	C11 and C2	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 6AU6 Limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 45		L21 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)		.05 Mfd.	10.7 Mc Unmodulated	FM 45		L22 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6AU6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L17 and L18 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BA6 1st IF.	.05 Mfd	10.7 Mc Unmodulated	FM 45		L13 and L14 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 6BE6 converter tube	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L9 and L10 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
9 (c)(d)	FM Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c)(d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 and L3 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.
11 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C17	Set oscillator to dial scale.
12 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C7 Det., C7 Ant.	Align detector and ant. stages for maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless a IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

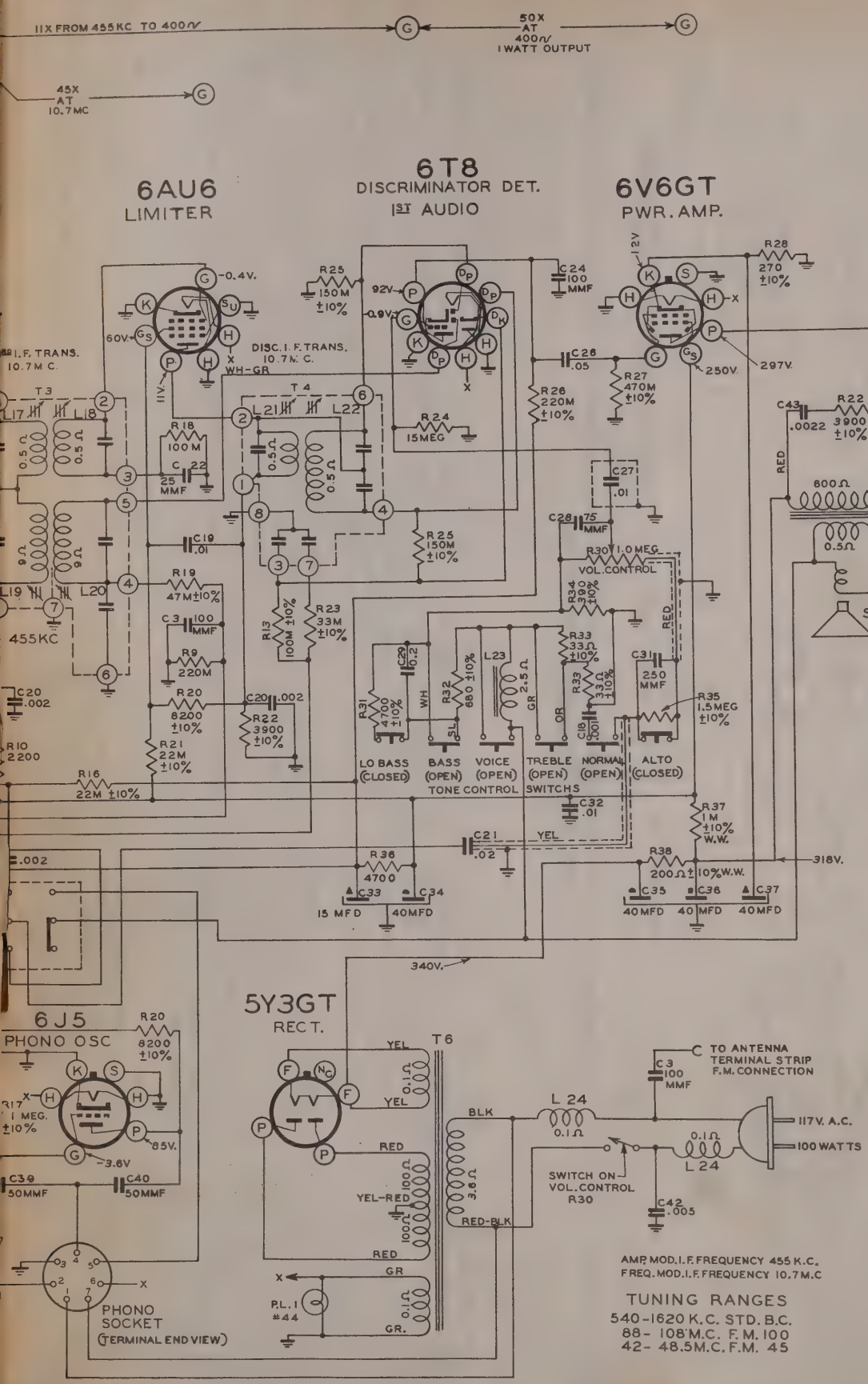
(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).

(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

DESCRIPTION	REF. NUMBER	PART NUMBER	PRICE
DIAL ASSEMBLY			
Dial Light Mounting Bracket		12-1434	.21
Dial Scale (use S-14270)		26-396	
Dial Pointer		26-397	
Dial Pointer Shaft		78-459	
Dial Cord Tension Spring		78-797	
Dial Light Socket		80-69	.21
Dial Cord (Linen)		80-580	.03
Dial Cord Tension Spring		80-444	.03
Tuner Arm Tension Spring		80-581	.03
Tuner Arm Stop Spring		80-580	.03
Tuner Arm Pressure Spring		80-582	.03
Tuner Assembly		188-132	.06
Retaining Ring (78-4994)		1.09c	
Dial Dust Gasket			.06
Control Pulley Assembly			.21
Dial Cord & Eyelet Assembly (Short)			.21
Dial Cord & Eyelet Assembly (Long)			.21
Dial Scale Pointer Assembly			.21
Tuner Arm Assembly			.21
COILS AND CHOKES			
Broadcast Oscillator Coil Assembly	L1,L7	S11157	.30
Broadcast Antenna Coil Assembly	L2,L8	S11158	.30
F.M. Oscillator Coil Assembly	L25	S12259	2.20
Phono Oscillator Coil Assembly	L23	S12603	
F.M. Detector Coil Assembly	L4	S13971	
1st I.F. Transformer Assembly	L9,L10	S13970	
2nd I.F. Transformer Assembly	L13,L14	S13972	
3rd I.F. Transformer Assembly	L17,L18	S13973	
Discriminator Transformer Assembly	T1	S13974	
Broadcast Detector Coil Assembly	T2	S13975	
F.M. Antenna Coil Assembly	T4	S13976	
Choke Coil Assembly	L5	S14132	
Tuner Arm Assembly (26-396)		S14429	
Dial Scale Pointer Assembly (Long)		S14270	
Dial Scale Pointer Assembly (Short)		S14269	
Control Pulley Assembly		S14258	
Dial Cord & Eyelet Assembly (Short)		S14288	
Dial Cord & Eyelet Assembly (Long)		S14289	
CONDENSERS			
.05MFD. (Ceramic)	C26	22-171	.30
.01MFD. (Ceramic)	C32	22-186	.20
250MMFD. (or 22-1745)	C31	22-1235	.20
.05MFD.	C21	22-830	.20
.05MFD.	C24	22-385	.20
.05MFD.	C34	22-829	.20
.01MFD. (Mica) (or 22-1670)	C22	22-1236	.20
.05MFD.	C18	22-1220	.20
250MMFD. (or 22-1745)	C20	22-1355	.20
.05MFD.	C38	22-1418	.20
.05MFD.	C19	22-1385	.20
.05MFD.	C30	22-1307	.20
.05MFD.	C29	22-1530	.20
.05MFD.	C39	22-1664	.20
.05MFD.	C3	22-1663	.20
.05MFD.	C6	22-1675	.20
.05MFD.	C8	22-1685	.20
.05MFD.	C10	22-1688	.20
.05MFD.	C17	22-1689	.20
.05MFD.	C7	22-1687	.20
.05MFD.	C5	22-1686	.20
.01MFD. (Ceramic)	C16	22-1691	.20
.01MFD. (Ceramic)	C15	22-1705	.20
.01MFD. (Ceramic)	C14	22-1717	.20
.01MFD. (Ceramic)	C13	22-1719	.20
.01MFD. (Ceramic)	C27	22-1718	.20
.01MFD. (Ceramic)	C33,C34	22-1717	.20
.01MFD. (Ceramic)	C9	22-1705	.20
.01MFD. (Ceramic)	C35	22-1691	.20
.01MFD. (Ceramic)	C12	22-1688	.20
.01MFD. (Ceramic)	C11	22-1687	.20
.01MFD. (Ceramic)	C4	22-1686	.20
.01MFD. (Ceramic)	C28	22-1675	.20
.01MFD. (Ceramic)	C1	22-1663	.20
.01MFD. (Ceramic)	C2	22-1664	.20
.01MFD. (Ceramic)	C23	22-1307	.20
.01MFD. (Ceramic)	C37	22-1530	.20
.01MFD. (Ceramic)	C36	22-1717	.20
.01MFD. (Ceramic)	C25	22-1720	.20
.01MFD. (Ceramic)	C43	22-1754	.20
Three Section Electrolytic 40MFD. -25V x40-40MFD. -450V.	C40,C41,C42	22-1719	.30
Two Section Electrolytic 15-40MFD. .0022MFD.	C44,C45	22-1720	.30
RESISTORS			
33M ohm (Insulated)	R4	63-957	.21
1M ohm (Insulated)	R6	63-1865	.21
270 ohm (Insulated WW)	R28	63-1863	.21
47Ω ohm (Insulated)	R35	63-1861	.21
22M ohm (Insulated)	R30	63-1859	.21
33M ohm (Insulated)	R37,R38	63-1589	.21
Volume Control and Switch (1000 ohm WW)	R1,R2	71-1722	.45
Two Section Candohm WW (30)	R33,R34	63-1737	.21
68 ohm (Insulated)	R29	63-1867	.21
390 ohm (Insulated)	R31	63-1869	.21
470 ohm (Insulated)	R7	63-1871	.21
680 ohm (Insulated)	R32	63-1776	.21
1000 ohm (Insulated)	R12	63-1873	.21
1500 ohm (Insulated)	R22	63-1810	.21
3300 ohm (Insulated)	R21	63-1813	.21
4700 ohm (Insulated)	R20	63-1815	.21
8200 ohm (Insulated)	R19	63-1817	.21
22M ohm (Insulated)	R16	63-1841	.21
22M ohm (Insulated)	R8	63-1842	.21
33M ohm (Insulated)	R23	63-1848	.21
MODEL 9H881 CABINET PARTS			
Plug Cap and Insulator (used on Record Changer Mounting Clip) (3 used)		15-82	.10
Shaft Bearing Disc		15-123	.05
Cabinet Hinge (L.H.)		27-54	.20
Cabinet Hinge (R.H.)		45-43	.30
Door Pull (2 used)		45-44	.55
Door and Tuning Control Knob (2 used)		45-645	.35
Band Switch Knob		45-716	.21
270° Switch Knob		45-524	.21
265-624 Cone and Voice Coil		57-1336	.15
Dial Escutcheon		57-1337	.72c
Cabinet Trim Strip (used on S-14353)		57-1263	.04
Screw-Steel Brass Plate (Esc Mtg) #2 x 3/8 Phillips Flat Hd. Wood		72-58	.02
Screw-Steel Brass Plate (Esc Mtg) #2 x 3/8 Phillips R.H. Self Tapping		78-798	.02
Record Changer Mounting Spring (4 used)		80-463	.21
Rubber Grommet (4 used)		81-244	.03
Cabinet Trim Strip (Chrome) 3/32 x 3/4 Brown Felt Washer (3 used)		83-1244	.03
Cabinet Trim Strip (Chrome) #2 x 1/2 Phillips R.H. Self Tapping Screw (3 used)		83-392	1.20c
Record Changer Mounting Screw 14		112-480	.03
		112-682	.06
RADIORGAN ESCUTCHEON PARTS			
Radiorgan Escutcheon (L.H.)		57-1352	.72c
Radiorgan Escutcheon (R.H.)		57-1353	.72c
Radiorgan Knob Retaining Ring		76-444	.04
Radiorgan Mounting Bracket Assembly (2 used)		80-435	.21
Radiorgan Mounting Screw (2 used)		80-436	.21
Radiorgan Self Tapping Screw		174-152	.04
Radiorgan Mounting Bracket Assembly (2 used)		S14055	.72c
Radiorgan Stop and Contact Assembly		S14260	.30
Radiorgan Strip and Contact Assembly		S14261	.30
Radiorgan Knob and Eyelet Assembly (Bass)		S14274	.21
Radiorgan Knob and Eyelet Assembly (Accomp.)		S14273	.21
Radiorgan Knob and Eyelet Assembly (Voice)		S14275	.21
Radiorgan Knob and Eyelet Assembly (Flute)		S14276	.21
Radiorgan Knob and Eyelet Assembly (Alto)		S14277	.21
Radiorgan Knob and Eyelet Assembly (Treble)		S14278	.21
Radiorgan Knob and Eyelet Assembly (Treble-Alto-Flute-Bass-Voice)		S14310	.21
Radiorgan Knob and Eyelet Assembly (Normal)		S14311	.21
MISCELLANEOUS			
Line Cord and Plug (9 ft. long) (for Speed Nut Timmerem		11-106	$0.01
Socket Cord and Plug		54-225	.21
Socket (Octal Tube		76-775	.21
Socket Miniature Tube (2 used)		76-780	.21
Socket Phone Cable (7 contact)		76-781	.21
Socket (Octal Tube (2 used)		76-783	.21
Socket (Loktal Tube (7 contact)		76-784	.20
Antenna Switch		80-421	.90
Rear Shield Mounting Bushing (4 used)		80-422	.40
Phono Reject Switch		80-424	.21
Power Transformer		94-386	.01
Output Transformer (2 used (L on 85-421)		95-1060	.03
Rubber Grommet (4 used)		125-52	.02
Miniature Tube Shield (Metal)		125-520	.10
Miniature Tube Shield (Paper)		125-521	.10
Heat Shield		125-569	.10
Tuning Core and Spring (3 used)		149-64	.40
470 ohm (Insulated)	R13	63-1856	.21
1000 ohm (Insulated)	R18	63-1806	.21
1500 ohm (Insulated)	R25	63-1876	.21
2200 ohm (Insulated)	R26	63-1880	.21
470M ohm (Insulated)	R27	63-1827	.21
1 Megohm (Insulated)	R17	63-1910	.21
1.5 Megohm (Insulated)	R35	63-1918	.21
2.2 Megohm (Insulated)	R11	63-1920	.21
15 Megohm (Insulated)	R24	63-1951	.21


11X FROM 455KC TO 400~
50X AT 400~ 1 WATT OUTPUT
45X AT 10.7MC
6AU6 LIMITER
6T8 DISCRIMINATOR DET. 1ST AUDIO
6V6GT PWR. AMP.
I.F. TRANS. 10.7 M.C.
DISC. I.F. TRANS. 10.7 M.C.
WH-GR
T3
T4
T5
T6
L17
L18
L19
L20
L21
L22
L23
L24
455KC
R10 2200
R16 22M ±10%
R17 1 MEG. ±10%
R18 100M
R19 47M ±10%
R20 8200 ±10%
R21 22M ±10%
R22 3900 ±10%
R23 33M ±10%
R24 15MEG
R25 150M ±10%
R26 220M ±10%
R27 470M ±10%
R28 270 ±10%
R30 1.0 MEG VOL. CONTROL
R31 4700 ±10%
R32 680 ±10%
R33 33Ω ±10%
R34 470 ±10%
R35 1.5MEG ±10%
R36 4700
R37 1M ±10% W.W.
R38 200Ω ±10% W.W.
C3 100 MMF
C9 .002
C18 .001
C19 .01
C20 .002
C21 .02
C22 25 MMF
C24 100 MMF
C25 .05
C27 .01
C28 75 MMF
C29 .2
C31 250 MMF
C32 .01
C33 15 MFD
C34 40MFD
C35 40MFD
C36 40 MFD
C37 40MFD
C39 50MMF
C40 50MMF
C42 .005
C43 .0022
LO BASS (CLOSED)
BASS (OPEN)
VOICE (OPEN)
TREBLE (OPEN)
NORMAL (OPEN)
ALTO (CLOSED)
TONE CONTROL SWITCHS
SWITCH ON VOL. CONTROL R30
TO ANTENNA TERMINAL STRIP F.M. CONNECTION
117 V. A.C.
100 WATTS
SP-1
800Ω
0.5Ω
2.5Ω
3.6Ω
0.1Ω
100Ω
12V
60V
92V
0.9V
-0.4V.
250V.
297V.
318V.
340V.
85V.
3.6V
6J5 PHONO OSC
5Y3GT RECT.
PHONO SOCKET (TERMINAL END VIEW)
P.L.1 #44
AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7M.C
TUNING RANGES
540-1620 K.C. STD. B.C.
88- 108 M.C. F.M. 100
42- 48.5 M.C. F.M. 45
CHASSIS

MODELS 12H090—12H091—12H092—12H093—12H094
CHASSIS Nos. 11C21-11C21Z

PART NO.	DIAL ASSEMBLY	PRICE
59-159	DIAL POINTER	1.00
76-417	BAND SWITCH DRIVE SHAFT	.24
76-418	TUNING CONTROL SHAFT	.30
78-585	DIAL LIGHT SOCKET & WIRE	.20
78-586	DIAL LIGHT SOCKET & WIRE	.22
80-85	INDICATOR TENSION SPRING	.10
80-402	DIAL CORD TENSION SPRING	.03
80-445	TUNER ARM PRESSURE SPRING	.10
80-446	TUNER ARM TENSION SPRING	.06
100-36	DIAL LIGHT BULB	.10
188-32	RETAINING RING	1.03C
S11330	DIAL CORD & EYELET ASSEM.	.09
S12242	IDLER BRACKET & SHAFT ASSEM.	.20
S12243	BUSHING, GEAR & INDICATOR ASSEM.	.59
S12245	GEAR & BUSHING ASSEM.	.33
S12248	GANG CONDENSER PULLEY BUSHING & CAM ASSEM.	.62
S12266	IDLER WHEEL & RUBBER RING ASSEM.	.25
S12294	DIAL SCALE RESONANCE TUBE CLAMP & BRACING STRIP ASSEM. (26-338)	1.98
S12296	TUNER ARM ASSEM.	.87
S12297	RESONANCE INDICATOR SOCKET & CABLE ASSEM.	.89

	COILS AND CHOKES	
S11344	B. C. & AUTOMATIC OSC. COUPLER COIL ASSEM. (L12)	1.06
S12249	1ST I. F. TRANSFORMER ASSEM. (T1)	3.47
S12250	2ND I. F. TRANSFORMER ASSEM. (T2)	3.72
S12251	3RD I. F. TRANSFORMER ASSEM. (T3)	3.00
S12252	DISCRIMINATOR TRANSFORMER ASSEM. (T4)	2.78
S12256	A. C. LINE CHOKE COIL ASSEM. (L27)	.35
S12281	WAVE TRAP COIL ASSEM. (L8)	.49
S12282	S. W. ANTENNA COIL ASSEM. (L4)	.29
S12291	S. W. DETECTOR COIL ASSEM. (L7)	.32
S12292	S. W. OSCILLATOR COIL ASSEM. (L11)	.40
S12293	B. C. DETECTOR COIL ASSEM. (L9)	.61
S12301	F. M. ANTENNA COIL ASSEM. (L3)	.49
S12302	F. M. DETECTOR COIL ASSEM. (L5)	.49
S12303	F. M. OSCILLATOR COIL ASSEM. (L10)	.37
S12529	ANTENNA LOADING COIL ASSEM. (L2)	.48

	CONDENSERS			
2-162	100 MMFD.	600 V.	(C24)	.20
2-171	.05 MFD.	600 V.	(C28)	.26
2-188	.02 MFD.	400 V.	(C43)	.20
2-196	.01 MFD.	600 V.	(C12)	.20
2-242	750 MMFD.	500 V.	(C36)	.26
2-289	50 MMFD.	600 V.	(C33)	.20
2-319	.005 MFD.	200 V.	(C34)	.20
2-365	100 MMFD.	600 V.	(C27)	.20
2-448	.004 MFD.	600 V.	(C30)	.20
2-829	.05 MFD.	200 V.	(C23)	.20
2-830	.02 MFD.	600 V.	(C25)	.20
2-912	.002 MFD.	600 V.	(C44)	.20
2-1041	.005 MFD.	600 V.	(C38)	.20
2-1126	.01 MFD.	400 V.	(C32)	.20
2-1127	.02 MFD.	400 V.	(C31)	.20
2-1135	.005 MFD.	600 V.	(C33)	.20
2-1138	500 MMFD.	600 V.	(C26)	.20
2-1169	.001 MFD.	600 V.	(C19)	.26
2-1257	.005 MFD.	1000 V.	(C39)	.26
2-1362	.004 MFD.	600 V.	(C29)	.20
2-1363	THREE GANG VARIABLE (C1)			6.20
2-1367	50 MMFD. (CERAMIC)	500 V.	(C18)	.33
2-1386	.02 MFD.	200 V.	(C42)	.20
2-1493	TRIMMER (F. M. ANT.)		(C6)	.45
2-1494	TRIMMER (F. M. DET.)		(C14)	.47
2-1497	TRIMMER (S. W. ANTENNA & WAVE TRAP) (C8, C9, C10)			1.25
2-1502	TRIMMER (S. W. OSC.)		(C16)	.38
2-1503	150 MMFD.	300 V.	(C7)	.38
2-1504	10 MMFD. (CERAMIC)	500 V.	(C3)	.33
2-1505	17 MMFD. (CERAMIC)	500 V.	(C13)	.33
2-1506	22 MMFD. (CERAMIC)	500 V.	(C5)	.33
2-1507	25 MMFD. (CERAMIC)	500 V.	(C2)	.33
2-1508	35 MMFD. (CERAMIC)	500 V.	(C11)	.33
2-1509	52 MMFD. (CERAMIC)	500 V.	(C20)	.33
2-1514	TRIMMER (F. M. OSC.)		(C22)	.38

	RESISTORS			
3-260	100M OHM	¼ W.	(R18)	.09
3-296	220M OHM	¼ W.	(R16)	.09
3-380	100M OHM	1 W.	(R17)	.12
3-503	15M OHM	½ W.	INSL. (R23)	.19
3-510	18M OHM	2 W.	INSL. (R7)	.36
3-579	220 OHM	¼ W.	(R8)	.09
3 585	2200 OHM	¼ W.	(R26)	.09
3 586	3300 OHM	¼ W.	(R25)	.09
3-592	33M OHM	¼ W.	(R13)	.09
3-593	47M OHM	¼ W.	(R5)	.09
3-595	100M OHM	¼ W.	(R20)	.09
63-600	2.2 MEGOHM	¼ W.	(R10)	.09
63-605	1M OHM	¼ W.	(R9)	.10
63-607	15M OHM	½ W.	(R1)	.10
63-620	33 OHM	¼ W.	(R32)	.09
63-626	120 OHM	¼ W.	(R33)	.09
63-651	82M OHM	¼ W.	(R22)	.09
63-712	33M OHM	½ W.	INSL. (R6)	.19
63-715	100M OHM	½ W.	INSL. (R2)	.19
63-752	1800 OHM	½ W.	INSL.	.19
63-803	2200 OHM	½ W.	(R15)	.10
63-885	82M OHM	½ W.	(R3)	.10
63-960	68M OHM	½ W.	(R11)	.10
63-976	15 MEGOHM	¼ W.	(R19)	.09
63-1349	VOLUME CONTROL & SW.		(R21)	1.81
63-1446	1200 OHM	½ W.	(R12)	.10
63-1447	120 OHM	½ W.	(R14)	.10
63-1448	5600 OHM	½ W.	(R4)	.10

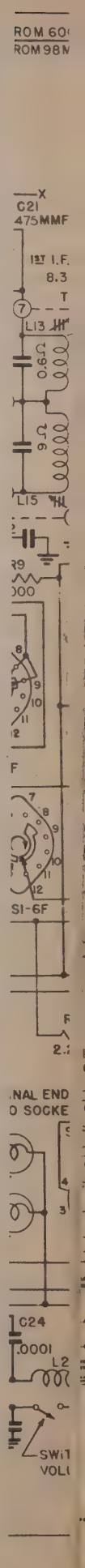
	AUDIO & POWER SUPPLY 11C21		
22-830	.02 MFD.	600 V.	(C25) .20
22-1257	.005 MFD.	1000 V.	(C39) .26
22-1496	DRY ELECTROLYTIC 30 x 30 MFD. 450 V. (C40, C41)		2.75
58-149	SEVEN PRONG PLUG (POWER CABLE)		.22
63-585	2200 OHM	¼ W.	(R26) .09
63-593	47M OHM	¼ W.	(R5) .09
63-597	470M OHM	¼ W.	(R30) .09
63-620	33 OHM	¼ W.	(R32) .09
63-648	47M OHM	¼ W.	(R27) .09
63-657	330M OHM	¼ W.	(R29) .09
63-1187	47M OHM	1 W.	INSL. (R28) .24
63-1189	200 OHM W. W.	2 W.	INSL. (R31) .36
78-128	SOCKET - 5 PRONG SPEAKER PLUG		.12
78-274	SOCKET - ELECTROLYTIC COND.		.03
78-376	SOCKET - OCTAL TUBE (8 CONTACT)		.12
78-644	SOCKET - CONNECTOR		.12
95-921	POWER TRANS. 117V 50-60 CYCLE (T5)		9.00
S12277	POWER CABLE & PLUG ASSEM.		1.80
S12359	CABLE ASSEM.		.25

	AUDIO & POWER SUPPLY 11C21Z		
22-830	.02 MFD.	600 V.	.20
22-417	0.1 MFD.	600 V.	.26
22-1257	.005 MFD.	1000 V.	.26
22-1611	40 MFD.	450 V.	1.81
22-1612	40 MFD.	450 V.	
	40 MFD.	450 V.	
63-585	2200 OHM	¼ W.	.09
63-648	47M OHM	¼ W.	.09
63-657	330M OHM	¼ W.	.09
63-1187	47M OHM	1 W.	
63-593	47M OHM	¼ W.	.09
63-597	470M OHM	¼ W.	.09
63-1189	200 OHM W. W.	2 W.	.36
63-1528	200 OHM W. W.	5 W.	
63-1527	1000 OHM W. W.	3 W.	
100-36	PILOT LIGHT	6.3 V. 25A	.10
49-577	12 INCH P. M. SPEAKER		15.40
95-921	POWER TRANSFORMER		9.00

	AUTOMATIC TUNING UNIT	
12-900	AUTOMATIC TUNING UNIT MTG. BRKT.	.18
22-846	AUTOMATIC TUNING UNIT TRIMMER	.20
22-847	AUTOMATIC TUNING UNIT TRIMMER	.26
22-848	AUTOMATIC TUNING UNIT TRIMMER	.33
22-859	AUTOMATIC TUNING UNIT TRIMMER	.26
22-868	480 MMFD. SILVER MICA (C37)	.38
22-873	AUTOMATIC TUNING UNIT TRIMMER	.33
24-287	AUTOMATIC TUNING UNIT CARDBOARD COVER	.04
85-370	AUTOMATIC TUNING UNIT SWITCH	4.70
112-223	ADJUSTING SCREW & CORE (4 USED)	.12
112-292	ADJUSTING SCREW & CORE (1 USED)	.12
S6928	AUTOMATIC TUNING COIL (RED)	.21
S6929	AUTOMATIC TUNING COIL (GREEN)	.21
S7021	AUTOMATIC TUNING COIL (YELLOW)	.21
S7859	AUTOMATIC TUNING COIL (BLUE)	.28
S10100	AUTOMATIC TUNING COIL (WHITE)	.28
S12331	AUTOMATIC TUNING UNIT - COMPLETE (U1)	11.82

	AUTOMATIC ESCUTCHEON PARTS	
46-562	AUTOMATIC STATION SELECTOR KNOB (5 USED)	.11
46-569	PHONO REJECT KNOB	.16
57-1064	AUTOMATIC SELECTOR KNOB ESCUTCHEON ONLY	.75
76-342	AUTOMATIC KNOB RETAINING SHAFT	.05
83-984	RUBBER STRIP	.04
83-1112	ESCUTCHEON TRIM STRIP	.60
S11424	AUTOMATIC TUNING ESC. & KNOB ASSEM. - COMPLETE	3.07
S12399	AUTOMATIC TUNING ESC. BRACKET & LATCH ASSEM.	.90

	RADIORGAN ESCUTCHEON PARTS	
57-1065	RADIORGAN ESCUTCHEON ONLY	.75
76-342	RADIORGAN KNOB RETAINING SHAFT	.05
83-1112	RADIORGAN ESC. TRIM STRIP	.60
S9606	RADIORGAN STRIP & CONTACT ASSEM. (PART OF S2)	.36



PART NUMBER	REF. NUMBER	DESCRIPTION	PRICE
114-148		#10 x 7/8" Hex Washer Hd. Self-Tapping Screw (4 used) (Chassis Mtg.)	$1.20c
114-233		#14 x 1-1/4" Slotted Hex Washer Hd. Self-Tapping Screw, Cad.	.07
125-56		Rubber Grommet (4 used) (Spk. Mtg.)	.05
138-25		Metal Grille	
159-52		Plug Button (4 used)	.09
165-13		Metal Glide (4 used)	
186-31		Rubber Bumper	
188-91		Rubber Ring (2 used)	
192-115		Dial Glass	
202-506		F. M. Instruction Book	.10
202-566		Instruction Book	
S12864		Drive Wheel & Pin Assembly (2 used)	.24
S14002		Intermixer Record Changer	
S14195		Loading Coil Assembly (9H881, 9H885, 9H888)	
S14305	L1	Low Impedance Loop Assembly (9H881, 9H885, 9H888)	
S14352		Record Changer Mtg. Frame Assembly (complete)	
S14353		Interconnecting Cable Assembly	

MODEL 9H882R CABINET PARTS

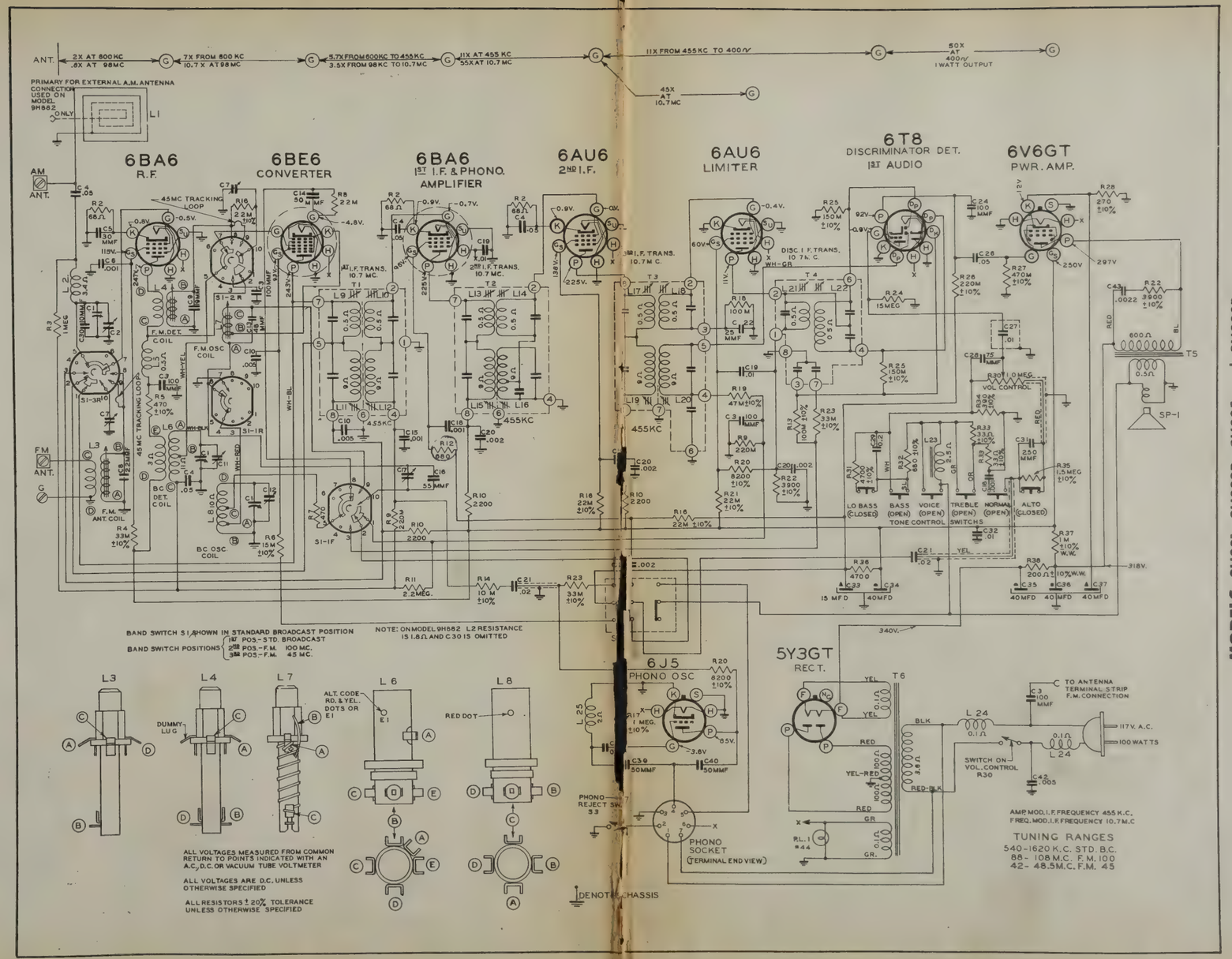
12-1183		Door Stop Bracket	
15-64		Pin Plate Plug	.06
15-65		Plug Cap & Insulator (used on S12591)	.27
15-82		Plug Cap & Insulator (used on S14539)	
19-123		Record Changer Mounting Clip (3 used)	.10
22-1240		Wavemagnet Trimmer Condenser	.20
22-1501		Electrolytic Capacitor, 150 Mfd, 60V.	3.40
36-39		Record Changer Frame Handle	
40-54		Cabinet Hinge	
46-697		Volume & Tuning Control Knob (2used)	
46-718		Band Switch Knob	.15
46-726		Phono Switch Knob (2 used)	
49-637		10" P.M. Speaker 208-637, Cone & Voice Coil	
52-188		Plug & Wire (used on S14539)	.24
57-1336		Dial Escutcheon	
57-1353		Diffusing Plate	
58-86		Two Prong Plug (used on S12591)	.12
58-132		6 Prong Plug	.12
58-169		7 Prong Plug (used on S14539)	
70-126		#10 x 1-7/8" R.H. Wood Screw-Steel N.P.	
72-58		#2 x 3/8" Phillips Flat Hds. Wood Screw (Esc. Mtg.) (6 used)	.02
78-555		Six Contact Socket (used on S12591)	.11
78-798		Seven Contact Phono Socket (used on S14539)	
80-407		Motor Mounting Spring (8 used)	.02
80-443		Cabinet Door Return Spring	.18
80-463		Record Changer Mtg. Spring (4 used)	.03
80-570		Shaft Tension Spring	
83-1244		Record Changer Trim Strip	1.00
83-1431		Plastic Strip	
85-351		Drive Out Control Switch (used on S12591)	1.90
85-382		S.P.D.T. Switch (used on S12591)	1.10
93-168		Rubber Shoulder Washer (6 used)	.07
93-392		Brown Felt Washer (3 used)	1.20c
93-540		Rubber Washer (4 used)	.10
94-502		Motor Mounting Bushing	.028
112-490		#8 x 5/8" Phillips R.H. Self Tapping Screw (Handle Mtg.)	
112-611		Record Changer Mtg. Screw (3 used)	.33
112-682		Record Changer Mtg. Screw (1 used)	.06
114-132		#10 x 1-5/8" Hex Washer Hd. Self-Tapping Screw (Chassis Mtg.)	.05
125-50		Rubber Grommet (2 used)	
125-51		Rubber Grommet (8 used)	
125-56		Rubber Grommet (4 used) (Spk. Mtg.)	.05
143-44		Drive Out Coupling	.45
165-12		Ball Bearing Caster (4 used)	
192-115		Dial Glass	
202-506		F. M. Instruction Book	.10
202-566		Instruction Book (Radio & Phono)	
S-12389	L2	Wavemagnet Loading Coil Assembly	.25
S-12411		Ball Bearing Shaft & Washer Assembly	5.53
S-12412		Phono Drive Out Motor, Mtg. Brkt. & Cable Assembly	44.50
S-12591		Drive Out Switch, Plug & Cable Assembly	5.29
S-14002		Intermixer Record Changer	
S-14445	L1	Wavemagnet Assembly-Type 30N	
S-14538		Record Changer Mounting Frame Assembly	
S-14539		Interconnecting Cable Assembly	
S-12583		Phono Drive Out Motor & Plug (141-91) Induction Motor)	42.00

MODEL 9H885 CABINET PARTS

15-82		Plug Cap & Insulator (used on S-14306)	
19-123		Record Changer Mounting Clip (3 used)	.10
40-42		Knife Hinge (R.H.)	.25
40-65		Knife Hinge (L.H.)	.25
46-662		Key Escutcheon (2 used)	.70
46-697		Volume & Tuning Knob (2 used)	
46-718		Band Switch Knob	.15
46-725		Door Pull (2 used)	
46-726		Phono Switch Knob (2 used)	
49-624		12" P.M. Speaker 208-624 Cone & Voice Coil	$
57-1336		Dial Escutcheon	
57-1353		Diffusing Plate	
58-169		Seven Prong Plug (7 used on S-14306)	
70-96		#10 x 1-3/4 R.H.W.S. Steel N.P. (6 used)	.02
72-58		#2 x 3/8" Phillips Flat Hd. Wood Screw-(Esc. Mtg.) (6 used)	.015
78-798		Seven Contact Socket (used on S-14306)	
80-423		Chassis Lift Spring (2 used)	.21
80-463		Record Changer Mounting Spring (4 used)	.03
83-1244		Record Changer Trim Strip	1.00
93-392		3/32" x 33/64" x 1" Brown Felt Washer (3 used)	
112-558		#10-32 x 7/8 Flat Phillips Hd. M.S. Steel-Statuary Bronze (Pinch Pt.)	.04
112-611		Record Changer Mtg. Screw (3 used)	.33
112-682		Record Changer Mtg. Screw (1 used)	.06
114-257		#10 x 1-3/8" Hex Slotted Washer Hd. Sheet Metal Screw	.03
125-49		Rubber Grommet (4 used)	.05
125-56		Rubber Grommet (4 used) (49-624)	.05
159-61		Plug Button-Statuary Bronze	.03
165-9		Metal Glides	
192-115		Dial Glass	
202-506		F. M. Instruction Book	.10
202-566		Instruction Book (Radio & Phono)	
S-10796		Lid Support Arm, Hinge Plate & Brkt. (R.H.)	1.85
S-10797		Lid Support Arm, Hinge Plate & Brkt. (L.H.)	1.85
S-11429		Record Changer Mounting Frame Assembly	10.08
S-12545		Phono Lift Spring & Bushing Assembly	.43
S-14002		Intermixer Record Changer Assembly	
S-14195		Loop Loading Coil Assembly	
S-14305		Low Impedance Loop Assembly	
S-14306		Interconnecting Cable Assembly (Phono.)	
S-14433		Chassis Compartment Hinge Assembly (R.H.)	
S-14434		Chassis Compartment Hinge Assembly (L.H.)	

MODEL 9H888R CABINET PARTS

15-82		Plug Cap & Insulator (used on S-14306)	
19-123		Record Changer Mounting Clip (3 used)	.10
40-42		Knife Hinge (R.H.)	.25
40-65		Knife Hinge (L.H.)	.25
46-648		Door Pull (2 used)	.55
46-659		Key Escutcheon	
46-697		Volume & Tuning Control Knob (2 used)	
46-718		Band Switch Knob	.15
46-726		Phono Switch Knob	
49-624		12" P.M. Speaker 208-624 Cone & Voice Coil	
57-1336		Dial Escutcheon	
57-1353		Diffusing Plate	
58-169		Seven Prong Plug (used on S14306)	
70-96		#10 x 1-3/4" R.H.W.S.-Steel N.P. (6 used)	.02
72-58		#2-3/8" Phillips Flat Hds. Wood Screw	.02
78-798		Seven Contact Socket (used on S14306)	
80-423		Chassis Lift Spring (2 used)	.21
80-463		Record Changer Mtg. Screw (4 used)	.03
83-1244		Record Changer Trim Strip	1.00
93-392		3/32" x 33/64" x 1 Brown Felt Washer (3 used)	1.20c
112-558		#10-32 x 7/81 Flat Phillips Hd M. Screw-Steel-Statuary-Bronze (Pinch Pt.)	.04
112-611		Record Changer Mounting Screw (3 used)	.33
112-682		Record Changer Mounting Screw (1 used)	.06
114-257		#10 x 1-3/8" Hex Slotted Washer Hd. Sheet Metal Screw	.03
125-49		Rubber Grommet	.05
125-56		Rubber Grommet	
138-26		Metal Grille	
159-61		Plug Button-Statuary Bronze	
165-9		Metal Glides (4 used)	.03
192-115		Dial Glass	
202-506		F.M. Instruction Book	.10
202-566		Instruction Book (Radio & Phono)	
S-10796		Lid Support Arm, Hinge Plate & Brkt. (R.H.)	1.85
S-10797		Lid Support Arm, Hinge Plate & Brkt. (L.H.)	1.85
S-11429		Record Changer Mtg. Frame Assembly	10.08
S-12545		Phono Lift Spring & Bushing Assembly	.43
S-14002		Intermixer Record Changer	
S-14195		Loop Loading Coil Assembly	
S-14305		Low Impedance Loop Assembly	
S-14306		Interconnecting Cable Assembly (Phono)	
S-14433		Chassis Compartment Hinge Assembly (R.H.)	
S-14434		Chassis Compartment Hinge Assembly (L.H.)	



MODELS 9H881, 9H882R, 9H885 and 9H888R

CHASSIS 9E21

MODELS 12H090 – 12H091 – 12H092 – 12H093 – 12H094
CHASSIS Nos. 11C21-11C21Z

TO THE SERVICE MAN:

The 11C21 chassis incorporate a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

AM Alignment: The alignment of this chassis on the short wave and standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

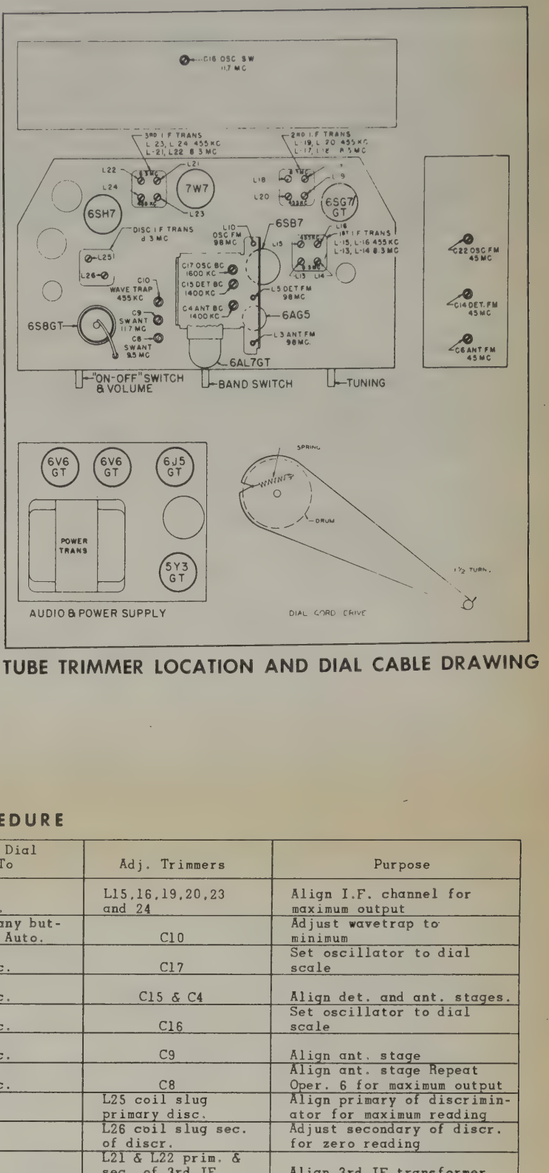
FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counterclockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments. The second 8.3 Mc IF stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides a satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. THE LOAD RESISTOR MUST BE REMOVED AFTER ALIGNMENT.

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 9) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L15,16,19,20,23 and 24	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	Aut.	Press any button on Auto.	C10	Adjust wavetrap to minimum
3	2 Turns loosely coupled to wavemag.		1600 Kc. Modulated	BC	1600 Kc.	C17	Set oscillator to dial scale
4	2 Turns loosely coupled to wavemag.		1400 Kc. Modulated	BC	1400 Kc.	C15 & C4	Align det. and ant. stages.
5	Antenna Post (Remove line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C16	Set oscillator to dial scale
6	Antenna Post (Remove line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C9	Align ant. stage
7	Antenna Post (Remove line ant.)	400 ohms	9.7 Mc. Modulated	SW	9.7 Mc.	C8	Align ant. stage Repeat Oper. 6 for maximum output
8 (a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L25 coil slug primary disc.	Align primary of discriminator for maximum reading
9 (b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L26 coil slug sec. of discr.	Adjust secondary of discr. for zero reading
10 (c)	Pin 6 (grid) on 7W7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L21 & L22 prim. & sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
11 (c) (d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L17 & L18 prim. & sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
12 (c) (d)	Pin 8 (grid) on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L13 & L14 prim. & sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
13 (c)	Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L10 Osc. coil Slug	Set oscillator to dial scale
14 (c)	Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 and L3 Det. and RF coil slugs	Align det. and Ant. stage to maximum reading
15 (c)	Antenna Post (Remove line ant.)	270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C22	Set oscillator to dial scale
16 (c)	Antenna Post (Remove line ant.)	270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C14 and C6	Align detector and ant. stages for maximum reading

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

A correct alignment can only be made if the following procedure is followed.

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead must be shielded.

An ordinary AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

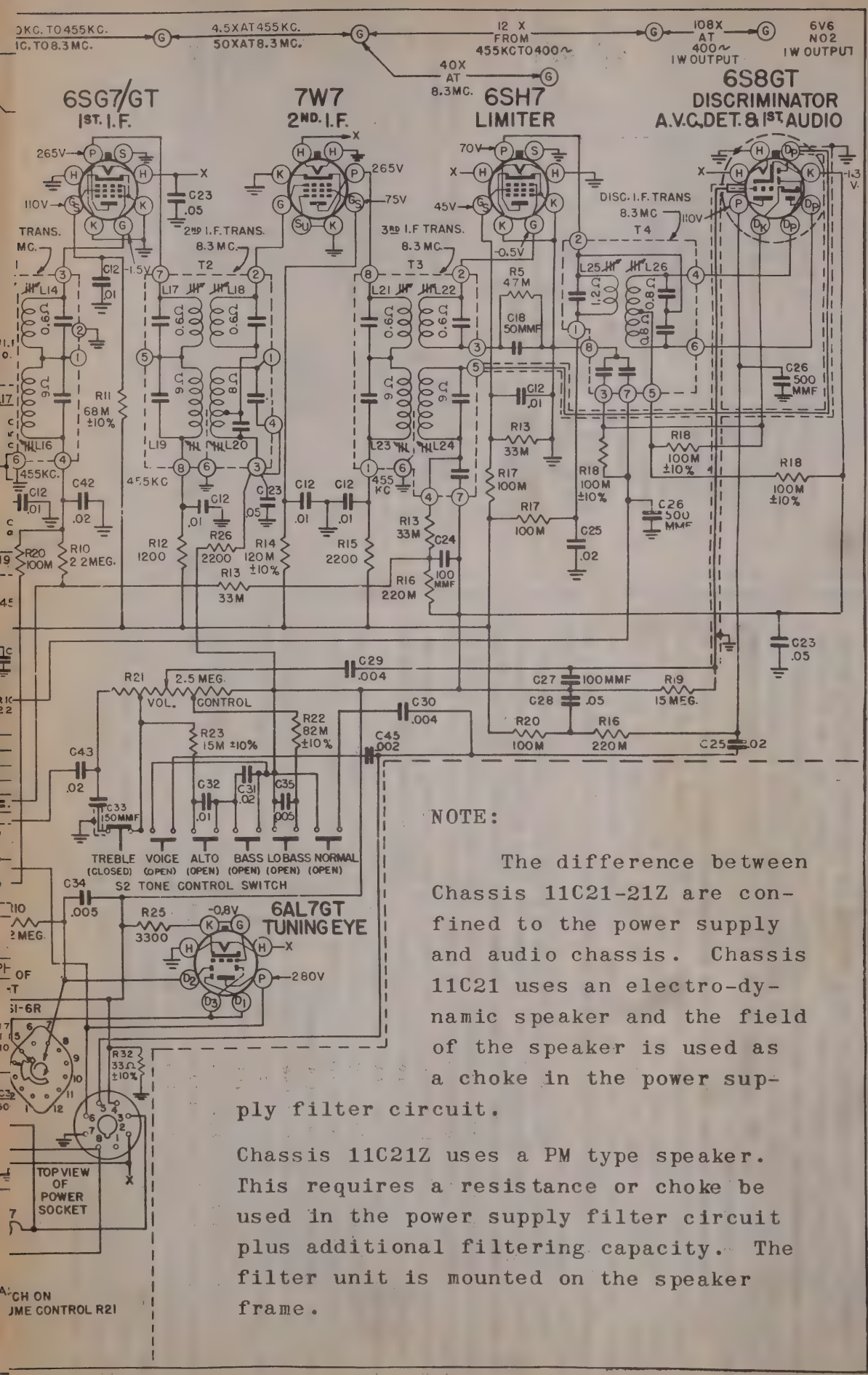
(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4 to chassis).

(d) 300 ohm ½ watt carbon resistor soldered across the secondary L18 (pin 2 and 3 of 2nd IF trans.). The leads to the resistor must be as short as possible and the resistor removed before operation 13 is started.

PARTS LIST

PART NO.		PRICE
	DIAL ASSEMBLY	
59-1159	DIAL POINTER	1.00
76-417	BAND SWITCH DRIVE SHAFT	.24
76-418	TUNING CONTROL SHAFT	.30
78-585	DIAL LIGHT SOCKET & WIRE	.22
80-885	INDICATOR TENSION SPRING	.09
80-445	TUNER ARM PRESSURE SPRING	.10
100-36	RETAINING RING	.06
188-32	DIAL LIGHT BULB	.10
1-03C	DIAL CORD & EYELET ASSEM.	.59
S11330	IDLER & BRACKET & SHAFT ASSEM	.09
S12242	GEAR & BUSHING ASSEM	.33
S12245	GANG CONDENSER PULLEY BUSHING & CAM ASSEM	.62
S12248	IDLER WHEEL & RUBBER RING ASSEM.	.25
S12256	DIAL SCALE RESONANCE TUBE CLAMP & RESONANCE INDICATOR SOCKET & CABLE ASSEM.	.89
S12294	TUNER ARM ASSEM. (26-338)	1.98
S12297		.87
S11344	B.C. & AUTOMATIC OSC. COUPLER COIL ASSEM.	1.06
	COILS AND CHOKES	
S12249	1ST I. F. TRANSFORMER ASSEM. (T1)	3.47
S12292	2ND I. F. TRANSFORMER ASSEM. (T2)	3.72
S12251	3RD I. F. TRANSFORMER ASSEM. (T3)	3.00
S12252	DISCRIMINATOR TRANSFORMER ASSEM.	2.78
	A.F.C. LINE CHOKE COIL ASSEM. (L27)	.35
S12256	WAVE TRAP COIL ASSEM. (L8)	.49
S12281	S. W. ANTENNA COIL ASSEM. (L4)	.29
S12282	S. W. DETECTOR COIL ASSEM. (L7)	.32
S12301	S. W. OSCILLATOR COIL ASSEM. (L9)	.60
S12302	F. M. ANTENNA COIL ASSEM. (L5)	.49
S12303	F. M. DETECTOR COIL ASSEM. (L6)	.49
S12529	F. M. OSCILLATOR COIL ASSEM. (L10)	.37
	ANTENNA LOADING COIL ASSEM. (L2)	.48
	CONDENSERS	
22-162	.100 MMFD.	.20
22-171	.100 MFD.	.20
22-188	.02 MFD.	.20
22-196	.01 MFD.	.20
22-242	750 MMFD.	.20
22-365	100 MMFD.	.20
22-448	.005 MFD.	.20
22-829	.05 MFD.	.20
22-830	.02 MFD.	.20
22-1041	.01 MFD.	.20
22-1126	.005 MFD.	.20
22-1127	.02 MFD.	.20
22-1135	.005 MFD.	.20
22-1168	.500 MMFD.	.20
22-1169	.600 MMFD.	.20
22-1386	.02 MFD.	.33
22-1362	THREE GANG VARIABLE (C1)	2.20
22-1363	.004 MFD.	.20
22-1257	.005 MFD.	.20
22-1493	.02 MFD.	.20
22-1494	.01 MFD.	.20
22-1497	TRIMMER (F. M. ANT.) (C6)	.45
	TRIMMER (F. M. DET.) (C14)	.47
22-1502	TRIMMER IS W. ANTENNA & WAVE TRAP) (C8, C9, C10)	1.25
22-1504	TRIMMER IS W. OSC.) (C16)	.38
22-1505	17 MMFD. (CERAMIC) (C3)	.33
22-1506	22 MMFD. (CERAMIC) (C5)	.33
22-1507	25 MMFD. (CERAMIC) (C2)	.33
22-1508	35 MMFD. (CERAMIC) (C11)	.33
22-1509	52 MMFD. (CERAMIC) (C20)	.33
22-1514	TRIMMER (F. M. OSC.) (C22)	.38
	RESISTORS	
63-260	100M OHM	.09
63-396	220M OHM	.09
63-579	1.5M OHM	.09
63-510	1M OHM	.09
63-585	2200 OHM	.09
63-586	3300 OHM	.09
63-593	47M OHM	.09
63-595	100M OHM	.09
63-596	4.7M OHM	.09
63-597	47M OHM	.09
63-620	33 OHM	.09
63-626	820 OHM	.09
63-752	1800 OHM	.09
63-803	2200 OHM	.09
63-885	82M OHM	.09
63-976	15 MEGOHM	.09
63-1349	VOLUME CONTROL & SW.	1.81
63-1446	1200 OHM	.10
63-1447	120 OHM	.10
63-1448	5600 OHM	.10
63-600	2.2 MEGOHM	.09
63-605	3.3 MEGOHM	.09
63-607	15M OHM	.09
63-620	33 OHM	.09
63-626	820 OHM	.09
63-712	33M OHM	.09
63-715	100M OHM	.09
63-752	1800 OHM	.09
63-803	2200 OHM	.09
63-885	82M OHM	.09
63-976	15 MEGOHM	.09
63-1349	VOLUME CONTROL & SW.	1.81
63-1446	1200 OHM	.10
63-1447	120 OHM	.10
63-1448	5600 OHM	.10
	AUDIO & POWER SUPPLY (11C21	
	.02 MFD. 600 V. (C25)	.20
	.005 MFD. 1000 V. (C39)	.26
	DRY ELECTROLYTIC 30 x 30 MFD. 450 V. (C40, C41)	2.75
58-585	5 PRONG SPEAKER PLUG (POWER CABLE)	.22
63-593	47M OHM	.09
63-597	47M OHM	.09
63-620	33 OHM	.09
63-648	470M OHM	.09
63-657	220 OHM W. W.	.09
63-1189	200 OHM W. W.	.09
63-1528	200 OHM W. W.	.09
63-1527	1000 OHM W. W.	.09
63-1529	2 LONG, 1 SHT. W. SPEAKER	.09
95-921	POWER TRANSFORMER ASSEM.	12.00
	AUTOMATIC TUNING UNIT	
12-900	AUTOMATIC TUNING UNIT MTG. BRKT.	.18
22-842	AUTOMATIC TUNING UNIT TRIMMER	.26
22-845	AUTOMATIC TUNING UNIT TRIMMER	.26
22-859	AUTOMATIC TUNING UNIT TRIMMER	.33
22-868	AUTOMATIC TUNING UNIT TRIMMER	.26
22-873	AUTOMATIC TUNING UNIT TRIMMER	.38
22-876	480 MMFD. SILVER MICA (C37)	.33
22-877	AUTOMATIC TUNING UNIT TRIMMER	.33
84-370	ADJUSTING SCREW & CORE (4 USED)	.70
112-223	ADJUSTING SCREW & CORE (1 USED)	.12
112-292	AUTOMATIC TUNING COIL (RED)	.21
S5928	AUTOMATIC TUNING COIL (GREEN)	.21
S5929	AUTOMATIC TUNING COIL (YELLOW)	.28
S7859	AUTOMATIC TUNING COIL (WHITE)	.28
S10100	AUTOMATIC TUNING UNIT COMPLETE (U1111)	82.00
S12331		
	AUDIO & POWER SUPPLY (11C21Z	
22-830	.02 MFD. 600 V.	.20
22-1257	.005 MFD. 1000 V.	.26
22-1611	40 MFD. 450 V.	1.81
22-1612	40 MFD. 450 V.	
63-585	2200 OHM.	.09
63-648	470M OHM.	.09
63-657	220 OHM W. W.	.09
63-597	47M OHM.	.09
63-593	47M OHM.	.09
63-1189	200 OHM W. W.	.09
63-1528	200 OHM W. W.	.09
63-1527	1000 OHM W. W.	.09
63-1529	2 LONG, 1 SHT. W. SPEAKER	.09
95-921	POWER TRANSFORMER ASSEM.	12.00
	AUTOMATIC TUNING UNIT	
12-900	AUTOMATIC TUNING UNIT MTG. BRKT.	.18
22-842	AUTOMATIC TUNING UNIT TRIMMER	.26
22-845	AUTOMATIC TUNING UNIT TRIMMER	.26
22-859	AUTOMATIC TUNING UNIT TRIMMER	.33
22-868	AUTOMATIC TUNING UNIT TRIMMER	.26
22-873	AUTOMATIC TUNING UNIT TRIMMER	.38
22-876	480 MMFD. SILVER MICA (C37)	.33
22-877	AUTOMATIC TUNING UNIT TRIMMER	.33
84-370	ADJUSTING SCREW & CORE (4 USED)	.70
112-223	ADJUSTING SCREW & CORE (1 USED)	.12
112-292	AUTOMATIC TUNING COIL (RED)	.21
S5928	AUTOMATIC TUNING COIL (GREEN)	.21
S5929	AUTOMATIC TUNING COIL (YELLOW)	.28
S7859	AUTOMATIC TUNING COIL (WHITE)	.28
S10100	AUTOMATIC TUNING UNIT COMPLETE (U1111)	82.00
S12331		
	AUTOMATIC ESCUTCHEON PARTS	
46-562	AUTOMATIC STATION SELECTOR KNOB	.11
46-569	PUSHBUTTON RELEASE KNOB	.16
57-1064	AUTOMATIC SELECTOR KNOB ESCUTCHEON ONLY	.26
76-342	AUTOMATIC KNOB RETAINING SHAFT	.75
S11424	RUBBER STRIP	.05
83-994	AUTOMATIC TUNING ESC. & KNOB ASSEM. COMPLETE	3.07
S11112	AUTOMATIC TUNING ESCUTCHEON TRIM STRIP & LATCH ASSEM	.90
	RADIORGAN ESCUTCHEON PARTS	
57-1065	RADIORGAN ESCUTCHEON	.75
76-342	RADIORGAN KNOB RETAINING SHAFT	.05
83-1112	RADIORGAN ESC. TRIM STRIP & CONTACT ASSEM. (PART OF S2)	.60
S9606	RADIORGAN STRIP & CONTACT ASSEM.	.36



NOTE:

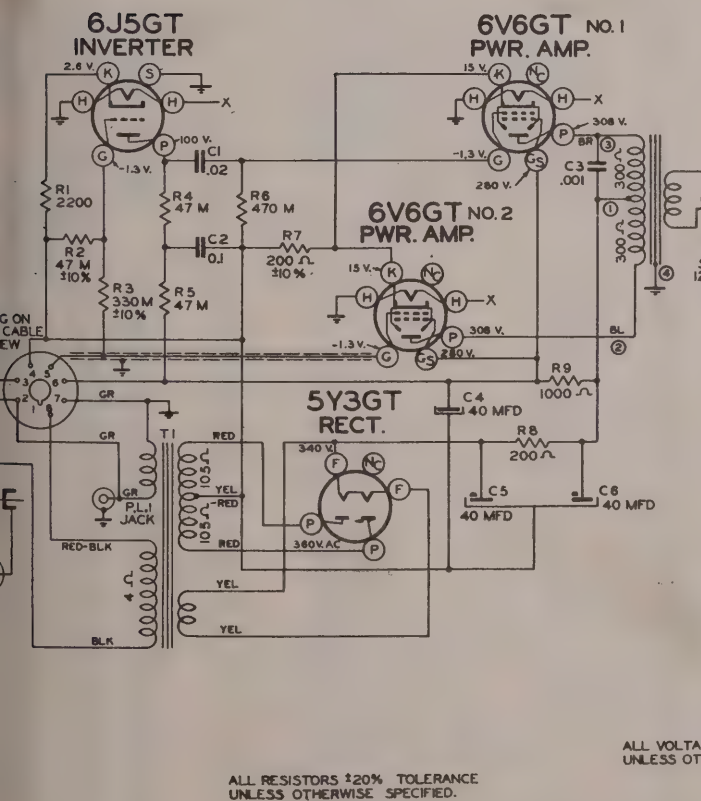
The difference between Chassis 11C21-21Z are confined to the power supply and audio chassis. Chassis 11C21 uses an electro-dynamic speaker and the field of the speaker is used as a choke in the power supply filter circuit.

Chassis 11C21Z uses a PM type speaker. This requires a resistance or choke be used in the power supply filter circuit plus additional filtering capacity. The filter unit is mounted on the speaker frame.

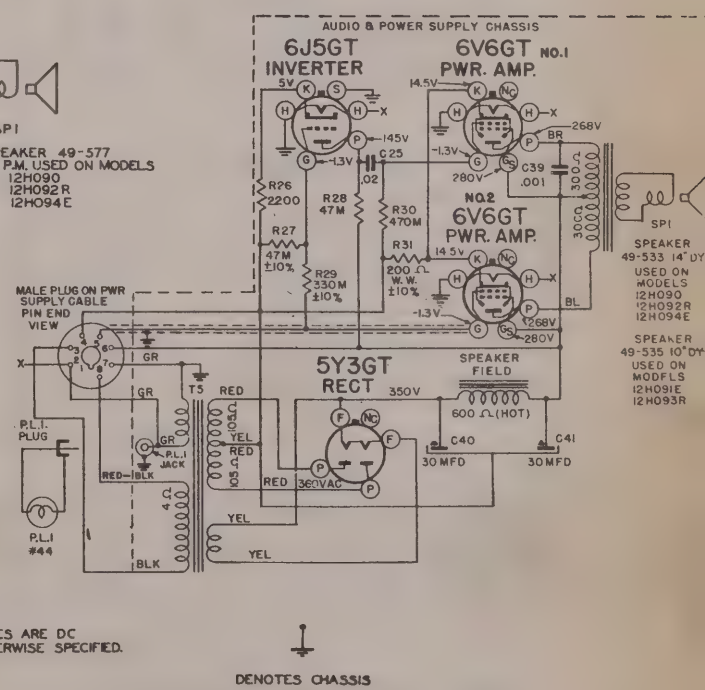
MODELS 12H090-12H091-12H092-12H093-12H094
CHASSIS No. 11C21-11C21Z

CHANGING CHASSIS 11C21 POWER SUPPLY FOR OPERATION WITH P.M. TYPE SPEAKERS

This P.M. speaker will replace electro-dynamic speakers, part number 49-533, and 49-535. These electro-dynamic speakers were used in chassis 11C21. Chassis 11C21Z uses P.M. speakers. To change over the 11C21 to 11C21Z it will be necessary to add two resistors, (1000 ohm 3 watt and a 200 ohm 5 watt), and one 40 MFD. filter capacitor. Change capacitors C40, and C41 to 40 MFD. See the schematics below for complete details.



ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.



ALL VOLTAGES ARE DC UNLESS OTHERWISE SPECIFIED.

DENOTES CHASSIS

11C21Z POWER SUPPLY WIRED FOR P.M. SPEAKERS

11C21 POWER SUPPLY WIRED FOR ELECTRO-DYNAMIC SPEAKERS

S11415	RADIORGAN KNOB & EYELET ASSEM. (NORMAL)	.16
S11416	RADIORGAN KNOB & EYELET ASSEM. (LO-BASS)	.16
S11417	RADIORGAN KNOB & EYELET ASSEM. (BASS)	.16
S11418	RADIORGAN KNOB & EYELET ASSEM. (ALTO)	.16
S11419	RADIORGAN KNOB & EYELET ASSEM. (VOICE)	.16
S11420	RADIORGAN KNOB & EYELET ASSEM. (TREBLE)	.16
S11422	RADIORGAN ESC. & KNOB ASSEM. COMPLETE (PART OF S2)	3.41
S12397	RADIORGAN ESC. BRACKET & LATCH ASSEM.	1.04

MISCELLANEOUS

11-97	LINE CORD & PLUG (10 FT.)	.95
27-87	SILVER MICA DISC (475 MMFD.) (C21)	.03
57-1054	SPARK PLATE	.10
68-1	AUTOMATIC TUNING ADJUSTMENT WRENCH	.03
78-363	SOCKET - WAVEMAGNET PLUG	.07
78-376	SOCKET - OCTAL TUBE (8 CONTACT)	.12
78-580	SOCKET - NINE CONTACT	.22
78-684	SOCKET OCTAL (WOULDED)	.28
78-685	SOCKET - MINIATURE TUBE	.26
78-708	SOCKET - OCTAL (SPECIAL)	.16
80-451	TUBE RETAINING SPRING	.12
93-168	RUBBER CUSHION WASHER	.07
93-215	RUBBER CUSHION WASHER	.07
93-392	BROWN FELT KNOB WASHER (3 USED)	1.20C
125-49	CHASSIS MTG. RUBBER GROMMET	.05
125-56	SPEAKER MTG. RUBBER GROMMET	.05
126-379	LOKTAL TUBE SHIELD	.07
149-54	F. M. IRON CORE & SPRING (3 USED)	.60
188-48	TUNING KNOB DECORATIVE RING (USED ON S11558)	.04
197-15	LIGHT DIFFUSING CUP	.40
202-426	PHONO INSTRUCTION BOOK	.12
202-427	INSTRUCTION BOOK & CALL LETTER TABS	.40
S11558	TUNING KNOB & RING ASSEM. (3 USED)	.28
S12356	BAND SW. & SHIELD ASSEM. (85-340) (S1)	11.17
S12360	FILAMENT CABLE #1	.39
S12361	CABLE ASSEM. #2	.44

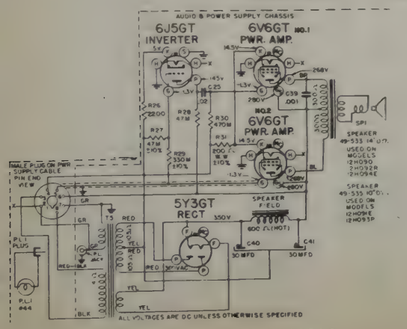
CABINET PARTS - 12H090-092R-094E

12-1138	WAVEMAGNET MTG. BRKT.	.14
15-23	CAP & INSULATOR (MALE) (USED ON S12393)	.12
15-62	CAP & INSULATOR (FEMALE) (USED ON S12393)	.22
19-123	PHONO UNIT MTG. CLIP (4 USED)	.10
49-533	14 INCH DYNAMIC SPEAKER (SP1)	16.00
	206-533 OUTPUT TRANSFORMER	3.29
	207-533 FIELD COIL (NOT REPLACEABLE)	
	208-533 CONE & VOICE COIL	5.26
57-1066	DIAL ESCUTCHEON PLATE	4.85
58-75	CONNECTOR PLUG (USED ON S12377)	.07
58-88	THREE PRONG WAVEMAGNET PLUG	.07
58-133	NINE PRONG MALE PLUG (USED ON S12393)	.12
69-193	1/4 - 20 x 2" R.H.M.S. (2 USED)	.04
69-230	#8-32 x 2" R.H.M.S. (1 USED)	.02
71-74	#10-32 x 7/8 FLAT PHILLIPS HD. M. S. (CHASSIS MTG.) (4 USED)	.02
72-38	#2 x 3/8 PHILLIPS FLAT HD. WOOD SCREW (ESC. MTG.)	.02
78-582	NINE PRONG FEMALE SOCKET (USED ON S12393)	.20
80-423	CHASSIS LIFT SPRING (2 USED)	.21
80-463	PHONO UNIT MTG. SPRING (4 USED)	.03
83-1150	TRIM STRIP	.84
83-1220	CABINET DIAL LIGHT SOCKET MTG. STRIP	.03
90-367	CABINET DIAL LIGHT TUBE	.01
94-479	SPRING BUSHING (2 USED)	.38
112-420	1/4 - 28 SPECIAL OVAL HD. M. S. (4 USED ON INTERMIXER)	.33
114-202	WAVEMAGNET MTG. BRKT. SCREW (2 USED)	.03
114-251	AMPLIFIER CHASSIS MTG. SCREW (4 USED)	.03
171-7	CABINET PILOT LIGHT LENS	.20
192-96	DIAL CRYSTAL	2.50
196-67	DIAL CRYSTAL DUST GASKET	.78
S10796	LID SUPPORT ARM HINGE PLATE & BRKT. (R.H.) (092R-094E)	1.85
S10797	LID SUPPORT ARM HINGE PLATE & BRKT. (L.H.) (092R-094E)	1.85
S11429	RECORD CHANGER SUPPORT FRAME & ARM ASSEM.	10.08
S11918	HINGE ARM ASSEM. (R.H.) (090)	1.06
S11919	HINGE ARM ASSEM. (L.H.) (090)	1.06
S12111	WAVEMAGNET ASSEM. (TYPE 30E) (L1)	3.28
S12327	HINGE PLATE & BRKT. ASSEM. (R.H.) (090)	1.85
S12328	HINGE PLATE & BRKT. ASSEM. (L.H.) (090)	1.85
S12393	INTER-CONNECTING CABLE ASSEM. (OR S12604)	9.61
S12545	PHONO LIFT SPRING & BUSHING (2 USED)	.43
S13058	CABINET F. M. DIPOLE & S. W. ANTENNA ASSEM.	.75
S12377	CABINET PILOT LIGHT SOCKET, WIRE & PLUG ASSEM.	.86

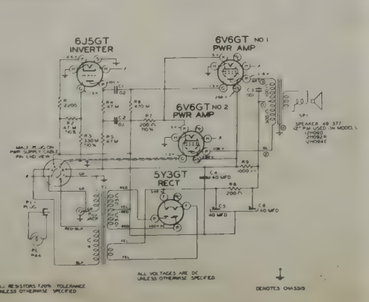
CABINET PARTS - 12H091E - 093R

15-62	CAP & INSULATOR (FEMALE) USED ON S12584)	.22
15-64	CAP & INSULATOR (USED ON S12584)	.06
19-123	PHONO UNIT MTG. CLIP (4 USED)	.10
22-1501	DRY ELECTROLYTIC - 150 MFD. 60V	3.40
49-535	10 INCH DYNAMIC SPEAKER (SP1)	11.00
	206-535 OUTPUT TRANSFORMER	2.57
	207-535 FIELD COIL (NOT REPLACEABLE).	
	208-535 CONE & VOICE COIL	3.41
52-188	TWO CONTACT SOCKET & WIRE (USED ON S12584)	.24
57-1066	DIAL ESCUTCHEON PLATE	4.85
58-86	TWO PRONG PLUG	.12
58-88	THREE PRONG WAVEMAGNET PLUG	.07
58-132	SIX CONTACT MALE PLUG (USED ON S12583)	.12
58-134	NINE PRONG PLUG (USED ON S12584)	.12
78-555	SIX CONTACT SOCKET	.11
78-582	NINE PRONG SOCKET (USED ON S12584)	.20
80-443	PHONO DOOR RETURN SPRING	.18
80-463	RECORD CHANGER MTG. SPRING (4 USED)	.03
83-1240	TRIM STRIP	.75
85-351	DRIVE OUT CONTROL SWITCH	1.90
85-382	LIFT LIMITING TOGGLE SWITCH	1.10
94-502	MOTOR MTG. BUSHING (USED ON S12412)	.03
112-420	1/4 W-28 SPECIAL OVAL HD. M. S. (4 USED ON INTERMIXER)	.33
114-61	#10-32 X 1 1/2 SLOTTED HEX WASHER HD. M. S. (2 USED)	.04
114-132	#10 x 1 5/8 SLOTTED HEX WASHER HD. S. T. SCREW (2 USED)	.05
143-44	DRIVE OUT COUPLING	.45
192-96	DIAL CRYSTAL	2.50
196-67	DIAL CRYSTAL DUST GASKET	.78
S11614	MOTOR MTG. BRACKET ASSEM. (USED ON S12412)	.72
S12394	WAVEMAGNET ASSEM. (TYPE 30K) (L1)	1.67
S12411	BALL BEARING SHAFT ASSEM.	5.53
S12412	PHONO DRIVE OUT MOTOR, MTG. BRKT. & CABLE ASSEM.	34.50
S12413	PHONO UNIT MTG. FRAME & BRKT. ASSEM.	7.00
S12583	PHONO DRIVE OUT MOTOR & PLUG ASSEM. (141-91 INDUCTION MOTOR)	32.00
S12584	INTER-CONNECTING CABLE ASSEM. (OR S12605)	5.25
S12865	FILTER CONDENSER SHIELD & CLAMP ASSEM.	.22
S13093	CABINET F. M. DIPOLE & S. W. ANTENNA ASSEM. (OR S13058)	.70

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

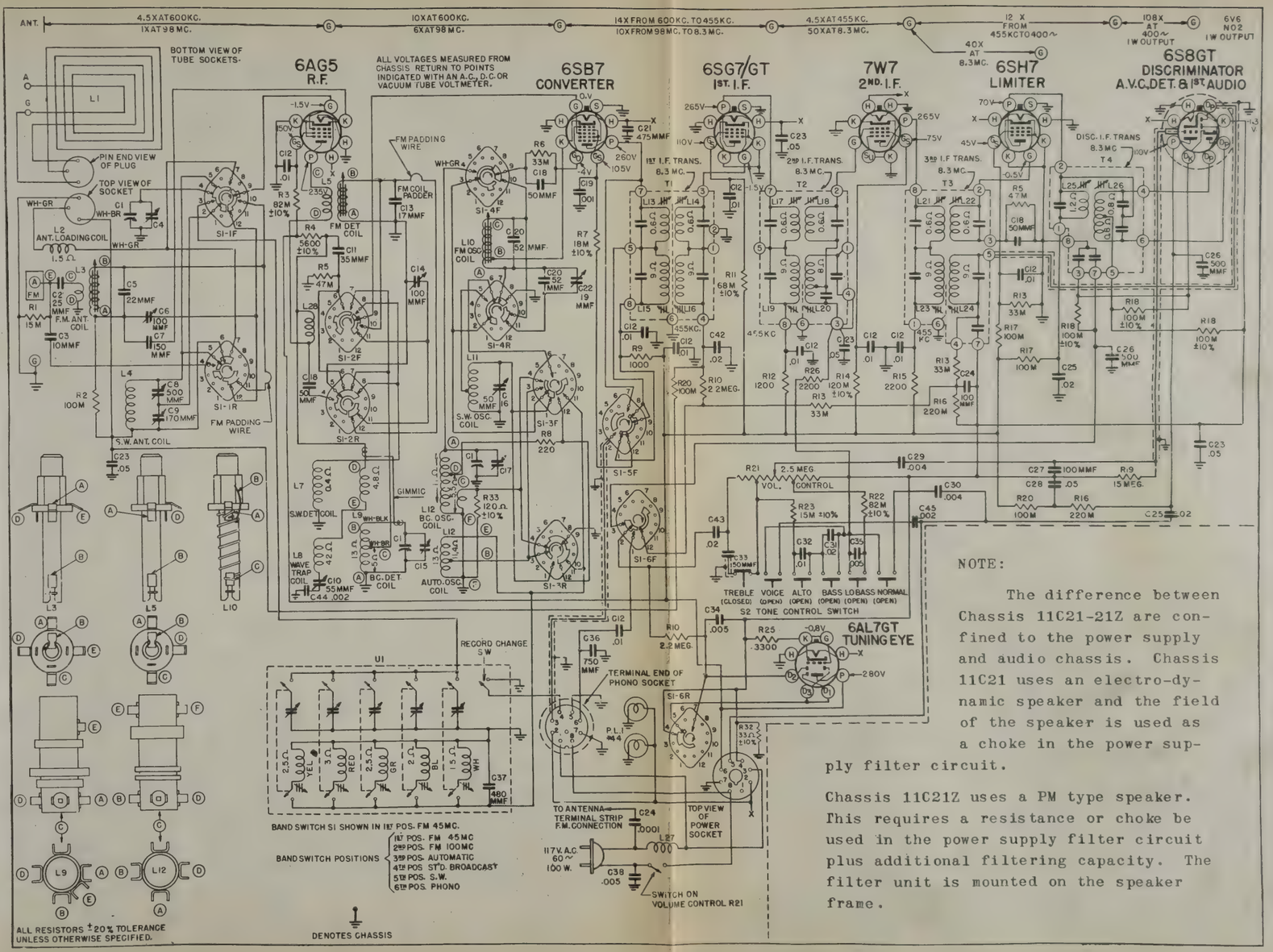

AUDIO & POWER SUPPLY CHASSIS
6J5GT INVERTER
6V6GT PWR. AMP.
6V6GT PWR. AMP.
5Y3GT RECT.
SPEAKER FIELD
600 (FUNIT)
30 MFD
30 MFD
SPEAKER 49-535 (4 OHM) USED ON MODELS 2H0930 2H0932 2H0942
SPEAKER 49-535 (10 OHM) USED ON MODELS 2H0931 2H0933
ALL VOLTAGES ARE DC UNLESS OTHERWISE SPECIFIED

POWER SUPPLY 11C21 CHASSIS



POWER SUPPLY 11C21Z CHASSIS

15M 2-18-47


ANT.
4.5XAT600KC. 1XAT98MC.
10XAT600KC. 6XAT98MC.
14X FROM 600KC. TO 455KC. 10X FROM 98MC. TO 8.3MC.
4.5XAT455KC. 50XAT8.3MC.
12 X FROM 455KC TO 400~
40X AT 8.3MC.
108X AT 400~ 1W OUTPUT
6V6 NO2 1W OUTPUT
6AG5 R.F.
6SB7 CONVERTER
6SG7/GT 1ST. I.F.
7W7 2ND. I.F.
6SH7 LIMITER
6S8GT DISCRIMINATOR A.V.C.DET. & 1ST AUDIO
BOTTOM VIEW OF TUBE SOCKETS
ALL VOLTAGES MEASURED FROM CHASSIS RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
PIN END VIEW OF PLUG
TOP VIEW OF SOCKET
FM PADDING WIRE
S.W. ANT. COIL
S.W. DET. COIL
S.W. OSC. COIL
BC. OSC. COIL
BC. DET. COIL
AUTO. OSC. COIL
GIMMIC
WAVE TRAP COIL
1ST I.F. TRANS. 8.3 MC.
2ND I.F. TRANS. 8.3 MC.
3RD I.F. TRANS. 8.3 MC.
DISC. I.F. TRANS 8.3 MC.
455 KC
RECORD CHANGE SW
TERMINAL END OF PHONO SOCKET
TREBLE VOICE (CLOSED) ALTO (OPEN) BASS (OPEN) LO BASS (OPEN) NORMAL (OPEN)
S2 TONE CONTROL SWITCH
6AL7GT TUNING EYE
TO ANTENNA TERMINAL STRIP F.M. CONNECTION
TOP VIEW OF POWER SOCKET
117 V. A.C. 60~ 100 W.
SWITCH ON VOLUME CONTROL R21
BAND SWITCH S1 SHOWN IN 1ST POS. FM 45MC.
BAND SWITCH POSITIONS
1ST POS. FM 45 MC
2ND POS. FM 100 MC
3RD POS. AUTOMATIC
4TH POS STD. BROADCAST
5TH POS. S.W.
6TH POS. PHONO
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS

NOTE:

The difference between Chassis 11C21-21Z are confined to the power supply and audio chassis. Chassis 11C21 uses an electro-dynamic speaker and the field of the speaker is used as a choke in the power supply filter circuit.

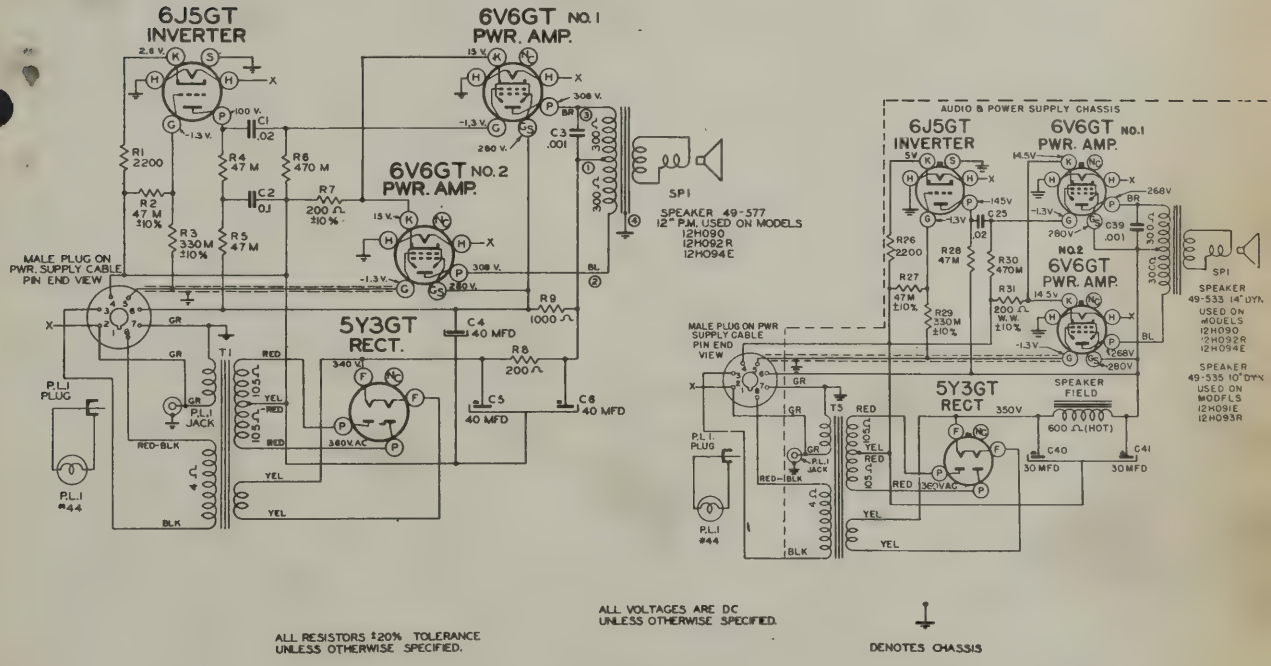
Chassis 11C21Z uses a PM type speaker. This requires a resistance or choke be used in the power supply filter circuit plus additional filtering capacity. The filter unit is mounted on the speaker frame.

MODELS 12H090-12H091-12H092-12H093-12H094

CHASSIS No. 11C21-11C21Z

CHANGING CHASSIS 11C21 POWER SUPPLY FOR OPERATION WITH P.M. TYPE SPEAKERS

This P.M. speaker will replace electro-dynamic speakers, part number 49-533, and 49-535. These electro-dynamic speakers were used in chassis 11C21. Chassis 11C21Z uses P.M. speakers. To change over the 11C21 to 11C21Z it will be necessary to add two resistors, (1000 ohm 3 watt and a 200 ohm 5 watt), and one 40 MFD. filter capacitor. Change capacitors C40, and C41 to 40 MFD. See the schematics below for complete details.


6J5GT INVERTER
6V6GT NO.1 PWR. AMP.
6V6GT NO.2 PWR. AMP.
5Y3GT RECT.
SPI
SPEAKER 49-577 12" P.M. USED ON MODELS 12H090 12H092R 12H094E
MALE PLUG ON PWR. SUPPLY CABLE PIN END VIEW
P.L.I PLUG
P.L.I JACK
P.L.I #44
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
ALL VOLTAGES ARE DC UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
AUDIO & POWER SUPPLY CHASSIS
SPEAKER 49-533 14" DYN. USED ON MODELS 12H090 12H092R 12H094E
SPEAKER 49-535 10" DYN. USED ON MODELS 12H091E 12H093R
SPEAKER FIELD
600 Ω (HOT)
30 MFD

11C21Z POWER SUPPLY WIRED FOR P.M. SPEAKERS

11C21 POWER SUPPLY WIRED FOR ELECTRO-DYNAMIC SPEAKERS

PARTS LIST

MODEL 14H789
CHASSIS 13D22

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
9-159		Dial Pointer	$1.00
6-417		Band Switch Drive Shaft	.24
6-418		Tuning Control Shaft	.30
8-585		Dial Light Socket and Wire Assembly	.20
8-586		Dial Light Socket and Wire Assembly	.22
0-85		Indicator Tension Spring	.10
0-402		Dial Cord Tension Spring	.03
0-445		Tuner Arm Pressure Spring	.10
0-446		Tuner Arm Tension Spring	.06
00-36		Dial Light Bulb	.09
88-32		Retaining Ring	1.03C
-11330		Dial Cord and Eyelet Assembly	.09
-12242		Idler Bracket and Shaft Assembly	.20
-12243		Bushing, Gear and Indicator Assembly	.59
-12245		Gear and Bushing Assembly	.33
-12248		Capacitor Pulley Bushing and Cam Assembly	.62
-12266		Idler Wheel and Rubber Ring Assembly	.25
-12294		Dial Scale and Bracing Strip Assembly (26-338)	1.98
-12296		Tuner Arm Assembly	.87
-12297		Resonance Indicator Socket and Cable Assembly	.89
		COILS AND CHOKES	
-11344	L12	Oscillator Coupler Coil Assem. (B.C. and Automatic)	1.06
-11591		Wavemagnet Loading Coil Assem. (Used on S-12356)	.28
-12249	T1	1st I.F. Transformer Assembly	3.47
-12250	T2	2nd I.F. Transformer Assembly	3.72
-12251	T3	3rd I.F. Transformer Assembly	3.00
-12252	T4	Discriminator Transformer Assembly	2.78
-12256	L27	A.C. Line Choke Coil Assembly	.35
-12281	L8	Wavetrap Coil Assembly	.49
-12282	L4	S.W. Antenna Coil Assembly	.29
-12291	L7	S.W. Detector Coil Assembly	.32
-12292	L11	S.W. Oscillator Coil Assembly	.40
-12293	L9	Broadcast Detector Coil Assembly	.61
-12301	L3	F.M. Antenna Coil Assembly	.49
-12302	L5	F.M. Detector Coil Assembly	.49
-12303	L10	F.M. Oscillator Coil Assembly	.37
-12529	L2	Antenna Loading Coil Assembly	.48
		CONDENSERS	
2-162	C24	100 Mmfd. .600 V.	.20
2-171	C28	.05 Mfd .600 V.	.26
2-188		.02 Mfd .400 V.	.20
2-196	C12	.01 Mfd .600 V.	.20
2-242	C36	750 Mmfd. .500 V.	.26
2-289	C33	50 Mmfd .600 V.	.20
2-319	C34	.005 Mfd. .200 V.	.20
2-365	C27	100 Mmfd. .600 V.	.20
2-448	C30	.004 Mfd. .600 V.	.20
2-829	C23	.05 Mfd .200 V.	.20
2-830	C25	.02 Mfd .600 V.	.20
2-912		.002 Mfd. .600 V.	.20
2-1041	C38	.005 Mfd. .600 V.	.20
2-1126	C32	.01 Mfd .400 V.	.20
2-1127	C31	.02 Mfd .400 V.	.20
2-1135	C35	.005 Mfd. .600 V.	.20
2-1138	C26	500 Mmfd. .600 V.	.20
2-1169	C19	.001 Mfd. .600 V.	.26
2-1257		.005 Mfd. 1000 V.	.26
2-1362	C29	.004 Mfd. .600 V.	.20
2-1363	C1	Three Gang Variable	6.20
2-1367	C18	50 Mmfd. (Ceramic) .500 V.	.33
2-1386		.02 Mfd .200 V.	.20
2-1431		.001 Mfd. .600 V.	.20
2-1493	C6	Trimmer (F.M. Ant.)	.45
2-1494	C14	Trimmer (F.M. Det.)	.47
2-1497	C-8-9-10	Trimmer (S.W. Antenna and Wave Trap	1.25
2-1502	C16	Trimmer (S.W. Osc.)	.38
2-1503	C7	150 Mmfd. .300 V.	.38
2-1504	C3	10 Mmfd. (Ceramic) .500 V.	.33
2-1505	C13	17 Mmfd. (Ceramic) .500 V.	.33
2-1506	C5	22 Mmfd. (Ceramic) .500 V.	.33
2-1507	C2	25 Mmfd. (Ceramic) .500 V.	.33
2-1508	C11	35 Mmfd. (Ceramic) .500 V.	.33
2-1509	C20	52 Mmfd. (Ceramic) .500 V.	.33
2-1514	C22	Trimmer (F.M. Osc.)	.38
		RESISTORS	
3-260	R18	100M Ohm .1/4 W.	.09
3-296	R16	220M Ohm .1/4 W.	.09
3-380	R17	100M Ohm. 1 W.	.12
3-441		1 Megohm .1/4 W.	.90
3-503	R23	15M Ohm (Insulated) .1/4 W.	.09
63-510	R7	18M Ohm (Insulated) 2 W.	.36
63-579	R8	220 Ohm .1/4 W.	.09
63-585	R26	2200 Ohm. .1/4 W.	.09
63-586	R25	3300 Ohm. .1/4 W.	.09
63-592	R13	33M Ohm .1/4 W.	.09
63-593	R5	47M Ohm .1/4 W.	.09
63-595	R20	100M Ohm. .1/4 W.	.09
63-600	R10	2.2 Megohm. .1/4 W.	.09
63-605	R9	1M Ohm. .1/2 W.	.10
63-607	R1	15M Ohm .1/2 W.	.10
63-620		33 Ohm. .1/4 W.	.09
63-626		120 Ohm .1/4 W.	.09
63-651	R22	82M Ohm .1/4 W.	.09
63-712	R6	33M Ohm (Insulated) .1/4 W.	.19
63-715	R2	100M Ohm. (Insulated) .1/4 W.	.19
63-752		1800 Ohm (Insulated) .1/4 W.	.19
63-803	R15	2200 Ohm. .1/2 W.	.10
63-1166	R3	33M Ohm .1/2 W.	.10
63-960	R11	68M Ohm .1/2 W.	.10
63-976	R19	15 Megohm .1/4 W.	.09
63-1349	R21	Volume Control and Switch	1.81
63-1446	R12	1200 Ohm. .1/2 W.	.10
63-1447	R14	120 Ohm .1/2 W.	.10
63-1448	R4	5600 Ohm. .1/2 W.	.10
		AUDIO POWER SUPPLY	
22-1128	C2	.02 Mfd .600 V.	.20
22-1134	C1	.002 Mfd. 1000 V.	.26
22-1515	C3, C4	Two Section Electrolytic 15 Mfd.-30 Mfd. .450 V.	2.50
58-149	P1	Moulded Plug - 7 Prong (Power Cable)	.22
63-577	R5	100 Ohm .1/4 W.	.09
63-648	R2	47M Ohm .1/4 W.	.09
63-776		330M Ohm. (Insulated) .1/4 W.	.19
63-797		2200 Ohm. .1/2 W.	.10
63-1551		Candohm Resistor	.70
63-1848	R8	33M Ohm .1/2 W.	.21
63-1880		180M Ohm (Insulated) .1/2 W.	.21
63-1883		220M Ohm (Insulated) .1/2 W.	.21
78-274		Socket - Electrolytic Capacitor (2 used)	.03
78-611		Socket - Octal Tube (6 used)	.12
78-644	P.L.I.	Socket - Single Contact	.12
78-732	S01	Socket - Speaker Plug	.15
95-956	T1	Power Transformer	15.50
95-957	L1	Filter Choke	4.50
S-13489		Internal Cable Assembly	.45
S-13490		External Cable Assembly	2.75
		AUTOMATIC TUNING UNIT	
12-900		Automatic Tuning Unit Mtg. Brkt.	.18
22-846		Automatic Tuning Unit Trimmer	.20
22-847		Automatic Tuning Unit Trimmer	.26
22-848		Automatic Tuning Unit Trimmer	.33
22-859		Automatic Tuning Unit Trimmer	.26
22-868	C37	480 Mmfd. Silver Mica	.38
22-873		Automatic Tuning Unit Trimmer	.33
24-287		Automatic Tuning Unit Cardboard Cover	.04
85-370		Automatic Tuning Unit Switch	4.70
112-223		Adjusting Screw and Core (4 used)	.12
112-292		Adjusting Screw and Core (1 used)	.12
S-6928		Automatic Tuning Coil (Red)	.21
S-6929		Automatic Tuning Coil (Green)	.21
S-7021		Automatic Tuning Coil (Yellow)	.21
S-7859		Automatic Tuning Coil (Blue)	.28
S-10100		Automatic Tuning Coil (White)	.28
S-12331		Automatic Tuning Unit Complete	11.82
		AUTOMATIC ESCUTCHEON PARTS	
46-674		Automatic Station Selector Knob (5 used)	.10
46-681		Phono Reject Knob	.15
57-1293		Automatic Plastic Escutcheon Plate only	.20
76-342		Automatic Knob Retaining Shaft	.05
83-984		Rubber Strip	.04
83-1112		Trim Strip	.60
S-12399		Automatic Bracket and Latch Assembly	.90
S-13671		Automatic Tuning Knob and Escutcheon Assembly Complete	3.50

MODEL 14H789
CHASSIS 13D22

TO THE SERVICE MAN:

The 13D22 chassis incorporate a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

AM Alignment: The alignment of this chassis on the short wave and standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

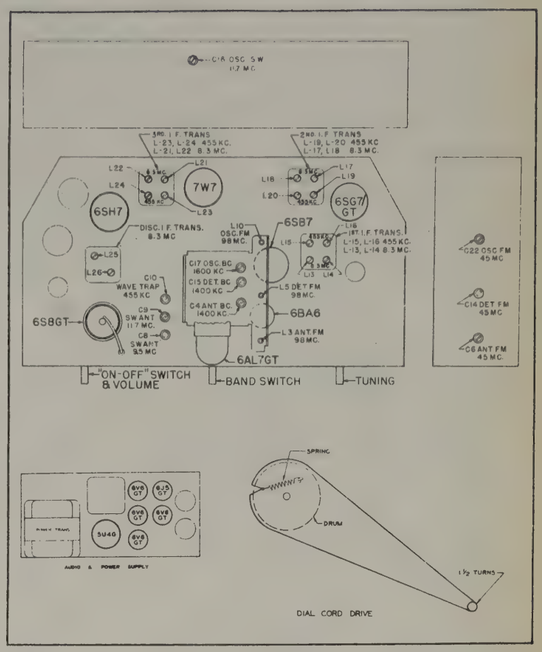
FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F. s. Observe the same precautions when making adjustments. The second 8.3 Mc IF stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides a satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. THE LOAD RESISTOR MUST BE REMOVED AFTER ALIGNMENT.

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 9) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L15,16,19,20,23 and 24	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6BA6 socket	.05 Mfd.	455 Kc Modulated	Aut.	Press any button on Auto.	C10	Adjust wavetrap to minimum
3	2 Turns loosely coupled to wavemag.		1600 Kc. Modulated	BC	1600 Kc.	C17	Set oscillator to dial scale
4	2 Turns loosely coupled to wavemag.		1400 Kc. Modulated	BC	1400 Kc.	C15 & C4	Align det. and ant. stages.
5	Antenna Post (Remove line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C16	Set oscillator to dial scale
6	Antenna Post (Remove line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C9	Align ant stage
7	Antenna Post (Remove line ant.)	400 ohms	9.7 Mc. Modulated	SW	9.7 Mc.	C8	Align ant. stage Repeat Oper. 6 for maximum output
8 (a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L25 coil slug primary disc.	Align primary of discriminator for maximum reading
9 (b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L26 coil slug sec. of discr.	Adjust secondary of discr. for zero reading
10 (c)	Pin 6 (grid) on 7W7 2nd IF tube socket	.05 Mfd.	8.3 Mc.. Unmodulated	FM 45		L21 & L22 prim & sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
11 (c) (d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L17 & L18 prim. & sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
12 (c) (d)	Pin 8 (grid) on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L13 & L14 prim. & sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
13 (c)	Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L10 Osc. coil Slug	Set oscillator to dial scale
14 (c)	Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 and L3 Det. and RF coil slugs	Align det. and Ant. stage to maximum reading
15 (c)	Antenna Post (Remove line ant.)	270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C22	Set oscillator to dial scale
16 (c)	Antenna Post (Remove line ant.)	270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C14 and C6	Align detector and ant. stages for maximum reading

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

A correct alignment can only be made if the following procedure is followed.

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead must be shielded

An ordinary AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

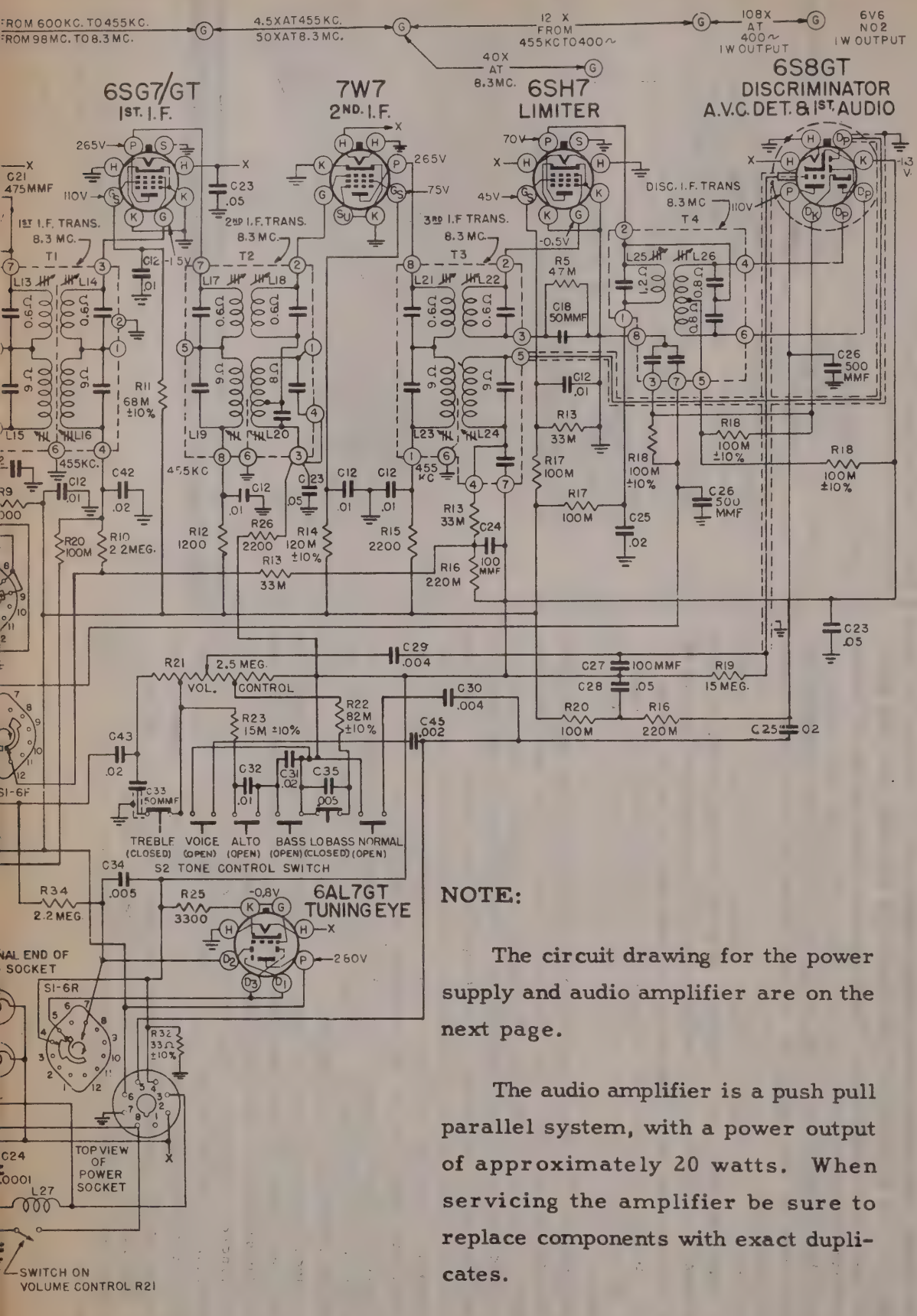
(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4 to chassis).

(d) 300 ohm ½ watt carbon resistor soldered across the secondary L18 (pin 2 and 3 of 2nd IF trans.). The leads to the resistor must be as short as possible and the resistor removed before operation 13 is started.

PARTS LIST

DESCRIPTION	REF. NO.	PART NO.	PRICE
DIAL ASSEMBLY			
Dial Pointer		59-159	$1.00
Band Switch Drive Shaft		76-417	.24
Tuning Control Shaft		76-418	.30
Dial Light Socket and Wire Assembly		78-585	.20
Dial Light Bulb		6-260	.09
Indicator Tension Spring		80-85	.22
Dial Cord Tension Spring		80-402	.03
Tuning Control Tension Spring		80-445	.10
Tuner Arm Pressure Spring		80-446	.06
Dial Light Bulb Retaining Ring		100-36	.03
Dial Cord and Eyelet Assembly		188-32	1.03C
Idler Bracket and Shaft Assembly		S-11330	.09
Bushing, Gear and Indicator Assembly		S-12242	.20
Gear and Bushing Assembly		S-12243	.59
Capacitor Pulley Bushing and Idler Assembly		S-12245	.33
Dial Scale and Bracing Strip Assembly (26-338)		S-12248	.62
Tuner Arm Assembly		S-12254	.25
Rubber Gear and Cable Assembly		S-12256	1.98
		S-12257	.87
		S-12297	.89
COILS AND CHOKES			
Oscillator Coupler Coil Assem. (R.C. and Automatic)		S-11344	1.06
Wavemagnet Loading Coil Assem. (Used on S-12356).		S-11591	.28
1st I.F. Transformer Assembly	L12		3.47
2nd I.F. Transformer Assembly	T1		3.00
3rd I.F. Transformer Assembly	T3		3.00
Discriminator Transformer Assembly	T4		
A.C. Line Choke Coil Assembly		S-12256	2.78
Wavemagnet Coil Assembly		S-12257	.35
S.W. Detector Coil Assembly	L27		.49
S.W. R.F. Coil Assembly	L7		.32
S.W. Oscillator Coil Assembly	L11		.40
Broadcast Detector Coil Assembly	L4		.61
F.M. Detector Coil Assembly	L5		.49
F.M. Oscillator Coil Assembly	L3		.37
Antenna Loading Coil Assembly	L10		.48
	L2		
CONDENSERS			
100 Mmfd. Trimmer (F.M. Ant.)	C6	22-1494	.25
Trimmer (F.M. Osc.)	C14	22-1497	.25
Wave Trap Trimmer (S.W. Ant. and Osc.)	C1-8-9-10	22-1502	1.25
150 Mmfd.	C16	22-162	.38
17 Mmfd. (Ceramic)	C23	22-171	.20
25 Mmfd. (Ceramic)	C13	22-188	.20
22 Mmfd. (Ceramic)	C5	22-242	.20
35 Mmfd. (Ceramic)	C11	22-289	.20
50 Mmfd.	C12	22-319	.20
.005 Mfd.	C36	22-365	.20
100 Mmfd.	C33	22-829	.20
.005 Mfd.	C34	22-830	.20
.02 Mfd.	C27	22-912	.20
.05 Mfd.	C32	22-1041	.20
.002 Mfd.	C38	22-1125	.20
.02 Mfd.	C31	22-1126	.20
.005 Mfd.	C35	22-1135	.20
.02 Mfd.	C37	22-1138	.20
.005 Mfd.	C26	22-1169	.20
500 Mmfd.	C19	22-1352	.20
.001 Mfd.		22-1362	.20
.02 Mfd.	C29	22-1363	.20
.001 Mfd. (Ceramic)	C18	22-1367	.20
.02 Mfd. (Ceramic)		22-1386	.20
Trimmer (F.M. Ant.)		22-1433	.20
Trimmer (F.M. Osc.)		22-1434	.20
Trimmer (S.W. Ant. and Osc.)		22-1502	.20
.05 Mfd.	C24	22-162	.38
.02 Mfd.	C28	22-171	.20
.02 Mfd.	C12	22-188	.20
.02 Mfd.	C36	22-242	.20
750 Mmfd.	C33	22-289	.20
.005 Mfd.	C34	22-319	.20
50 Mmfd.	C27	22-365	.20
100 Mmfd.	C32	22-829	.20
.005 Mfd.	C38	22-830	.20
.002 Mfd.	C31	22-912	.20
.02 Mfd.	C35	22-1041	.20
.005 Mfd.	C26	22-1125	.20
.02 Mfd.	C19	22-1126	.20
.005 Mfd.		22-1135	.20
.02 Mfd.	C29	22-1138	.20
.001 Mfd.	C18	22-1169	.20
.02 Mfd. (Ceramic)		22-1352	.20
Type Gang Variable		22-1362	.20
.001 Mfd. (Ceramic)		22-1363	.20
.02 Mfd. (Ceramic)		22-1367	.20
Trimmer (F.M. Ant.)		22-1386	.20
Trimmer (F.M. Osc.)		22-1433	.20
Trimmer (S.W. Ant. and Osc.)		22-1434	.20
		22-1502	.20
RESISTORS			
100M Ohm (Insulated)	R9	6-250	.09
220M Ohm	R16	6-296	.09
100M Ohm	R17	6-380	.09
1 Megohm		6-441	.09
15M Ohm (Insulated)	R23	6-503	.09
18M Ohm (Insulated)	R7	63-510	.36
2200 Ohm	R25	63-585	.09
3300 Ohm	R26	63-586	.09
33M Ohm	R13	63-592	.09
47M Ohm	R5	63-593	.09
2.2M Ohm (Insulated)	R20	63-594	.09
1M Ohm	R9	63-595	.09
33 Ohm	R1	63-605	.09
15M Ohm		63-607	.09
820 Ohm		63-626	.09
3.3M Ohm	R22	63-712	.09
100M Ohm (Insulated)	R6	63-715	.09
2200 Ohm	R2	63-752	.09
1800 Ohm	R3	63-803	.09
6.8M Ohm	R15	63-1166	.09
1200 Ohm	R19	63-1376	.09
5600 Ohm	R14	63-1448	.09
Volume Control and Switch (1 Meg)	R12	63-1446	1.81
1200 Ohm	R18	63-1447	.10
5600 Ohm	R24	63-1448	.10
100M Ohm (Insulated)	R8	63-1880	.09
220M Ohm (Insulated)	R21	63-1883	.09
15 Megohm		63-1976	.09
18M Ohm (Insulated)		63-1977	.09
2.2M Ohm (Insulated)		63-1978	.09
1M Ohm (Insulated)		63-1979	.09
3.3M Ohm (Insulated)		63-1980	.09
68M Ohm (Insulated)		63-1981	.09
10M Ohm (Insulated)		63-1982	.09
4.7M Ohm (Insulated)		63-1983	.09
22M Ohm (Insulated)		63-1984	.09
47M Ohm (Insulated)		63-1985	.09
2.2M Ohm (Insulated)		63-1986	.09
1M Ohm (Insulated)		63-1987	.09
33 Ohm (Insulated)		63-1988	.09
15M Ohm (Insulated)		63-1989	.09
820 Ohm (Insulated)		63-1990	.09
3.3M Ohm (Insulated)		63-1991	.09
100M Ohm (Insulated)		63-1992	.09
2200 Ohm (Insulated)		63-1993	.09
1800 Ohm (Insulated)		63-1994	.09
6.8M Ohm (Insulated)		63-1995	.09
1200 Ohm (Insulated)		63-1996	.09
5600 Ohm (Insulated)		63-1997	.09
AUDIO POWER SUPPLY			
.02 Mfd.	C2	22-1128	.20
.002 Mfd.	C1	22-1134	.20
Two Section Electrolytic 15 Mfd.-30 Mfd. 450 V.	C3, C4	22-1515	2.50
Molded Plug-7 Prong	P1	58-149	.20
100" Power Cable		63-577	.22
47M Ohm	R5	63-648	.09
330M Ohm (Insulated)	R2	63-776	.09
2200 Ohm		63-797	.09
Candohm Resistor	R8	63-1558	.10
180M Ohm (Insulated)		63-1880	.21
220M Ohm (Insulated)		63-1883	.21
Socket - Electrolytic Capacitor (2 used)		78-611	.03
Socket - Octal Tube (6 used)		78-732	.12
Power Transformer	T1	95-956	15.50
Filter Choke	L1	95-957	4.50
Internal Cable Assembly		S-13490	2.45
External Cable Assembly		S-13491	2.75
AUTOMATIC TUNING UNIT			
Automatic Tuning Unit Mfg. Brkt.		12-900	.18
Automatic Tuning Unit Trimmer 480 Mmfd.	C37	22-846	.26
Automatic Tuning Unit Trimmer 480 Mmfd. Silver Mica		22-847	.26
Automatic Tuning Unit Trimmer 24-287		22-858	.33
Automatic Tuning Unit Trimmer 22-873		22-868	.33
Automatic Tuning Unit Cardboard Cover		24-287	.04
Automatic Tuning Unit Switch Adjusting Screw and Nut (4 used)		85-370	4.70
Adjusting Screw and Core		112-223	.12
Automatic Tuning Coil (Red) (1 used)		112-282	.12
Automatic Tuning Coil (Green)		S-6928	.21
Automatic Tuning Coil (Yellow)		S-6929	.21
Automatic Tuning Coil (Blue)		S-7021	.21
Automatic Tuning Coil (White)		S-7859	.28
Automatic Tuning Unit Complete		S-12100	11.82
		S-12531	
AUTOMATIC ESCUTCHEON PARTS			
Automatic Station Selector Knob (15 used)		46-674	.10
Push Button Knob (4 used)		46-681	.15
Automatic Plastic Escutcheon Plate only		57-1293	.20
Automatic Knob Retaining Shaft		76-342	.05
Rubber Strip		83-984	.04
Automatic Bracket and Latch Assembly		83-1112	.60
Automatic Tuning Knob and Escutcheon Assembly Complete		S-12399	.90
		S-13671	3.50



NOTE:

The circuit drawing for the power supply and audio amplifier are on the next page.

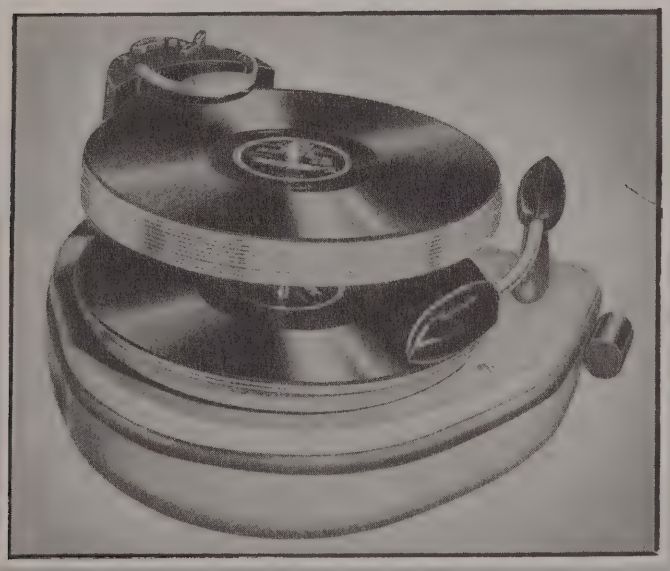
The audio amplifier is a push pull parallel system, with a power output of approximately 20 watts. When servicing the amplifier be sure to replace components with exact duplicates.

MODEL 14H789
CHASSIS 13D22

SERVICE MANUAL

MODEL S-11468

AUTOMATIC RECORD CHANGER



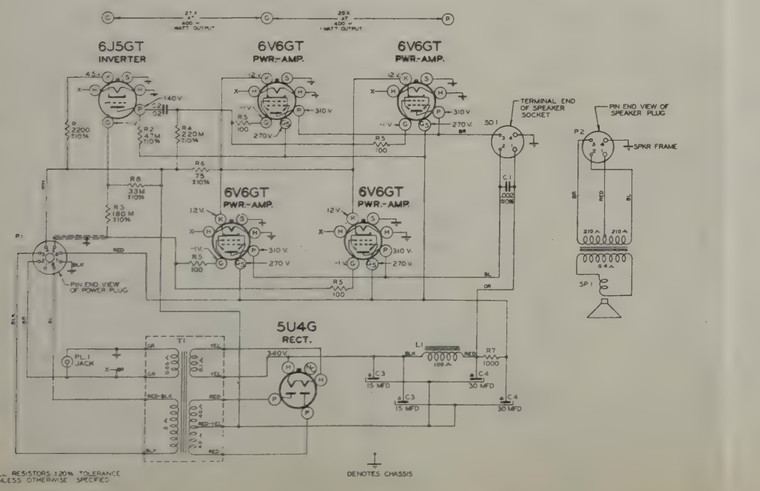
ZENITH RADIO CORPORATION

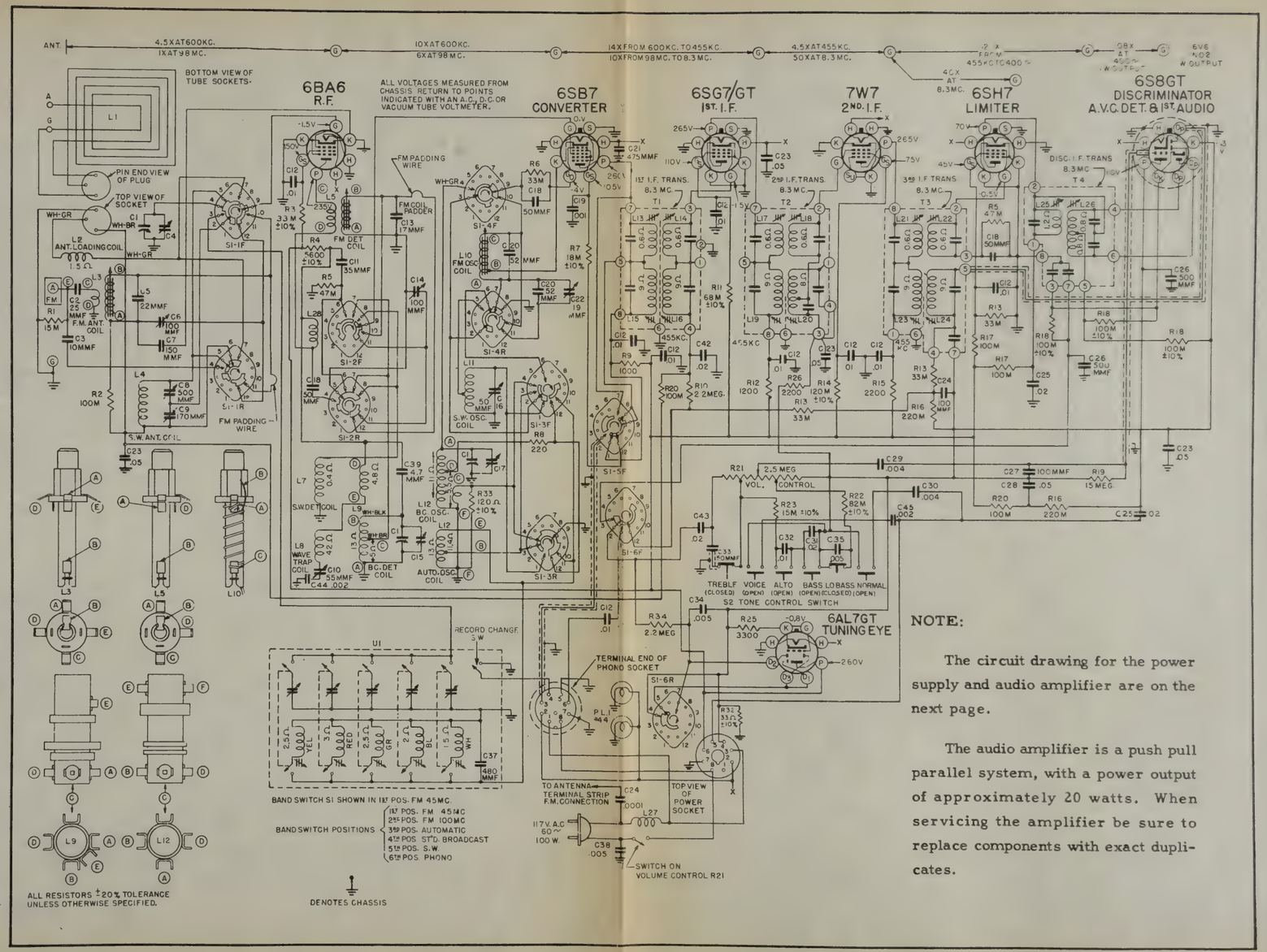
CHICAGO 39, ILLINOIS, U. S. A.

PARTS LIST--Continued

PART NO.	REF. NO.	DESCRIPTION	PRICE
		RADIORGAN ESCUTCHEON PARTS	
57-1294		Radiorgan Escutcheon Plate Only	$1.20
76-342		Radiorgan Knob Shaft	.05
83-1112		Radiorgan Escutcheon Trim Strip	.60
S-9606		Radiorgan Strip and Contact Assembly	.36
S-12397		Radiorgan Escutcheon Bracket and Latch Assembly	1.04
S-13472		Radiorgan Knob and Eyelet Assembly - Normal	.20
S-13475		Radiorgan Knob and Eyelet Assembly - Alto	.20
S-13476		Radiorgan Knob and Eyelet Assembly - Voice	.20
S-13667		Radiorgan Escutcheon and Knob Assembly Complete	4.00
S-13668		Radiorgan Knob and Eyelet Assembly - Lo-Bass	.20
S-13669		Radiorgan Knob and Eyelet Assembly - Bass	.20
S-13670		Radiorgan Knob and Eyelet Assembly - Treble	.20
		MISCELLANEOUS	
11-87		Line Cord and Plug	.65
27-87	C21	Silver Mica Disc (475 MMF.)	.03
57-1054		Spark Plate	.10
58-133		Nine Prong Plug (Used on S-13677)	.12
78-363		Socket - Wavemagnet Plug	.07
78-376		Socket - Octal Base Tube (8 Contact)	.12
78-580		Socket - Nine Contact (Phono)	.22
78-582		Socket - Nine Contact (2 used on S-13677)	.20
78-684		Socket - Octal Base Tube (Moulded)	.28
78-685		Socket - Miniature Tube	.26
80-451		Tube Retaining Ring	.12
125-49		Chassis Mtg. Rubber Grommet	.05
126-379		Loktal Tube Shield	.07
149-54		F.M. Iron Core and Spring (3 used)	.60
197-15		Light Diffusing Cup	.40
S-12356	S1	Band Switch and Shield Assembly (85-340)	11.17
S-12360		Filament Cable Assembly #1	.39
S-12361		Cable Assembly #2	.44
19-123			
24-388			
49-600	SP1		
57-1066			
57-1289			
69-193			
78-761			
80-423			
80-463			
83-1244			
90-367			
93-392			
100-36			
112-558			
112-670			
112-671			
114-257			
171-7			
192-96			
202-506			
202-512			
202-514			
202-515			
202-517			
S-12545			
S-13058			
S-13484			
S-13672			
S-13673			
S-13675			
S-13677			

PART NO.	REF. NO.	DESCRIPTION	PRICE
		CABINET PARTS	
		Phono Unit Mtg. Clip (3 used)	.10
		Record Changer Compartment Cover	.86
		12" P.M. Speaker	15.40
		206-600 Output Transformer	2.63
		208-600 Cone and Voice Coil	4.60
		Dial Escutcheon Plate	4.85
		Ornamental Plate (Zenith) (Used on S-13484)	.85
		1/4-20 x 2" R.H.M.S. (2 used on S-12545)	.04
		Pilot Light Socket	.50
		Chassis Lift Spring (2 used)	.21
		Phono Unit Mtg. Spring (4 used)	.03
		Record Changer Trim Strip	1.00
		Pilot Light Tube	.01
		3-32 x 33/64 x 1" Brown Felt Washer (3 used)	1.20c
		Pilot Light Bulb Hd	.09
		#10-32 x 7/8" Phillips Flat Hd. M.S. (Chassis Mtg.) (4 used)	.04
		Record Changer Mtg. Screw (1 used)	.07
		Record Changer Mtg. Screw (3 used)	.11
		#10 x 1-3/8" Slotted Hex Hd. Self Tapping Screw (2 used on S-13675)	.03
		Pilot Light Lens	.20
		Dial Crystal	2.50
		F.M. Instruction Book	.10
		Phono Instruction Book	.20
		Unpacking Instructions	.03
		Instruction Book	.20
		Station Identification Tabs	.40
		Phono Lift Spring and Bushing Assembly (2 used)	.43
		F.M. Dipole and Short Wave Antenna Assembly	.75
		Record Changer Support Frame and Arm Assembly	10.65
		Tuning Knob and Ring Assembly (46-680) (3 used)	.25
		Wavemagnet and Hinge Assembly (Complete) (Type 36A)	5.00
		Record Changer (Intermixer)	----
		Interconnecting Cable Assembly	4.00




6BA6 R.F.
6SB7 CONVERTER
6SG7/GT 1ST I.F.
7W7 2ND I.F.
6SH7 LIMITER
6S8GT DISCRIMINATOR A.V.C. DET. & 1ST AUDIO
6AL7GT TUNING EYE
ALL VOLTAGES MEASURED FROM CHASSIS RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
BOTTOM VIEW OF TUBE SOCKETS
TOP VIEW OF SOCKET
PIN END VIEW OF PLUG
FM PADDING WIRE
S.W. ANT. COIL
S.W. DET. COIL
BC. DET. COIL
BC. OSC. COIL
AUTO-OSC. COIL
S.W. OSC. COIL
FM OSC. COIL
FM DET. COIL
FM ANT. COIL
ANT. LOADING COIL
WAVE TRAP COIL
RECORD CHANGE SW
TERMINAL END OF PHONO SOCKET
TOP VIEW OF POWER SOCKET
TO ANTENNA TERMINAL STRIP F.M. CONNECTION
117 V. A.C. 60~ 100 W.
SWITCH ON VOLUME CONTROL R21
TREBLE (CLOSED) VOICE (OPEN) ALTO (OPEN) BASS (OPEN) LO BASS (CLOSED) NORMAL (OPEN)
S2 TONE CONTROL SWITCH
BAND SWITCH S1 SHOWN IN 1ST POS. FM 45 MC.
BAND SWITCH POSITIONS
1ST POS. FM 45 MC
2ND POS. FM 100 MC
3RD POS. AUTOMATIC
4TH POS. STD. BROADCAST
5TH POS. S.W.
6TH POS. PHONO
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS

NOTE:

The circuit drawing for the power supply and audio amplifier are on the next page.

The audio amplifier is a push pull parallel system, with a power output of approximately 20 watts. When servicing the amplifier be sure to replace components with exact duplicates.

MODEL 14H789
CHASSIS 13D22

SERVICE MANUAL

MODEL S-11468

AUTOMATIC RECORD CHANGER

ZENITH RADIO CORPORATION

CHICAGO 39, ILLINOIS, U. S. A.

TO THE SERVICE MAN:

This Service Manual has been prepared for the purpose of assisting the Service Man in his work of caring for the Record Changer mechanism, whether he is called to remedy some difficulty, or to insure continued satisfactory operation. The Zenith Automatic Record Changers are constructed with a minimum of working parts, and in operation are simple and reliable. However, as is the case with all mechanical units, misalignment and trouble may occasionally develop. The information presented in this book will enable the Service Man to render quick and accurate service. For convenience, the Operating Instructions supplied with each Record Changer are summarized as follows:

The Record changer will automatically play up to twelve 10 inch or ten 12 inch records at one loading. The Record Stack rests on the Spindle and the Record Shelf. The Selector Sprocket drives the Ejector Plate which pushes the records off the Shelf and Spindle allowing them to drop on the Turntable. To load for automatic operation, set the Record Size Selector Knob to 10 or 12, raise the Pressure Bar, press down lightly and turn the Spindle counter-clockwise to the load position, place the stack of records on the Spindle, lower the Pressure Bar until it rests on the Record Stack. Set the AUTO-MAN-OFF switch to AUTO and press the Record Change Button. The Changer will play the entire selection of records and will repeat the last record until it is turned off. For manual operation set the AUTO-MAN-OFF switch to MAN and play the records singly as on a non-automatic record player.

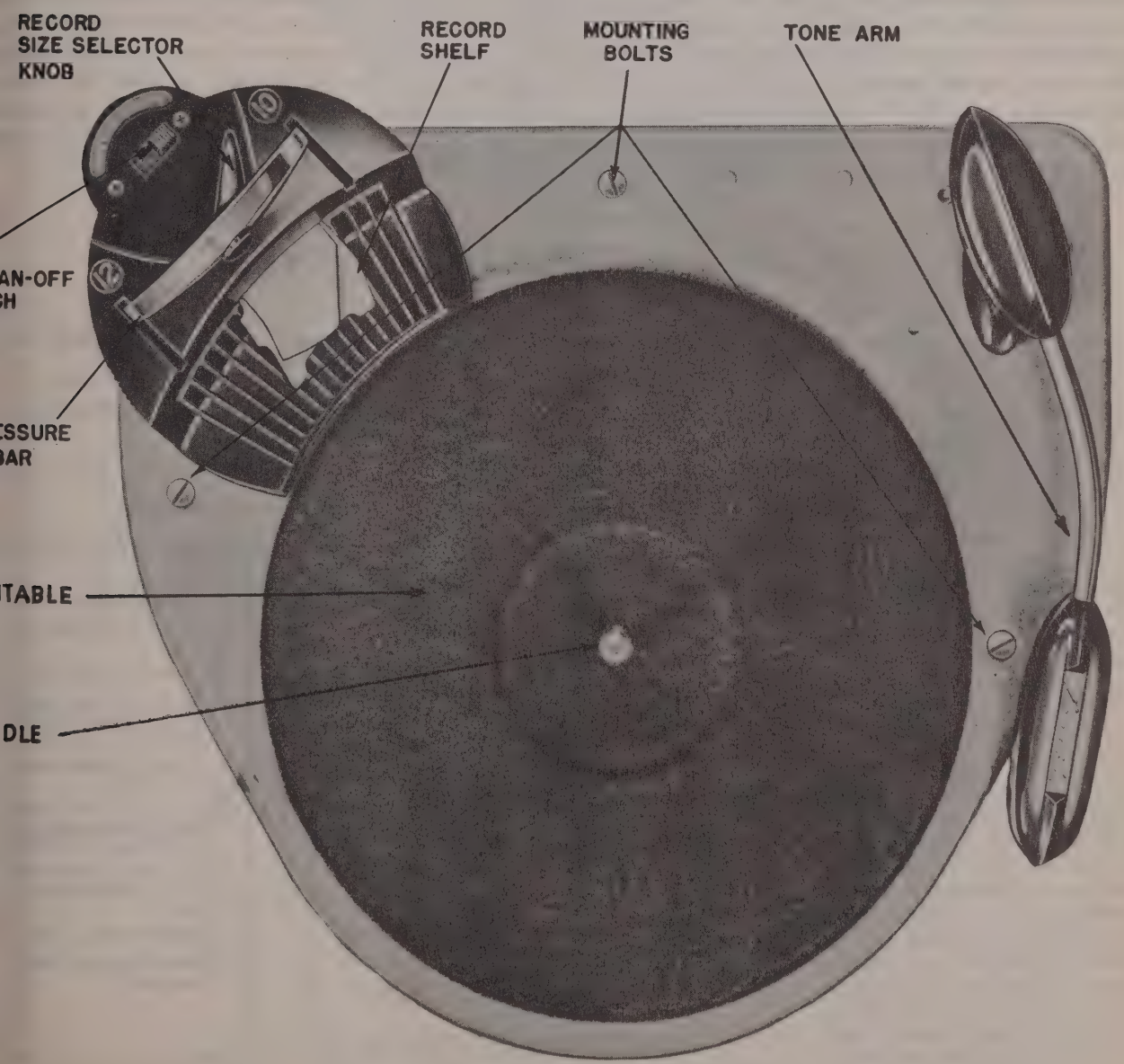


Fig. 1. Top View of Record Changer.

DESCRIPTION OF CYCLING

The motor drives an idler wheel which rim drives the turntable and the lower clutch section. The spindle is fixed and does not turn with the turntable. The solenoid energizing voltage is obtained from a 6 volt winding on the motor.

When the record change button on the receiver panel is pressed, the electric trip circuit is completed, solenoid is energized and the trigger pulled. (Fig. 4.) When the trigger is pulled, the trip plate return spring forces the trip plate down and opens the cut-out switch. The trip plate hits a stud on the clutch arm, raises the arm and engages the clutch. When the clutch is engaged, the chain drive sprocket is set into motion and drives the chain, selector sprocket and the timing sprocket. Through 360° rotation, the timing sprocket has eight functions which are as follows: 1. Raises the lift pin and tone arm off the record. The lift pin is in the groove of the timing sprocket when it is down and on the surface when up. 2. An emboss applies the brake to the tone arm. The brake consists of a friction plate which is pressed against the tone arm control lever to prevent coasting and erratic landing. 3. The locating pin hits the tone arm control lever and swings the tone arm laterally off the record. 4. The emboss resets the clutch trigger mechanism and closes the cut-out switch. 5. The locating pin swings the tone arm when a 12-inch record is played. On 10 inch records, the tone arm must swing an additional inch nearer the spindle and the greater diameter bushing, which is pushed upward by the record size lever, rides against the tone arm control lever. 6. Lift pin rides into the groove and lowers the tone arm over the starting groove of the record. 7. The emboss releases the brake. 8. Tip of the clutch arm drops into the synchronizing notch, releases the clutch arm and disengages the clutch.

The selector sprocket operates the record ejector plate and is timed with the timing sprocket to drop the record on the turntable when the tone arm is at its greatest outward swing. This is immediately after the number 3 function of the timing sprocket.

When the record is playing, the tone arm is moving toward the center of the record and the pawl on the tone arm control lever is moving toward the cycling switch trip lever ratchet. As the pawl enters the ratchet, the oscillating action, produced by the eccentric groove on the record, causes the cycling switch to close, complete the circuit through the solenoid and repeat the cycle. If the record does not have an eccentric groove, the position trip will close the cycling switch and start the next cycle.

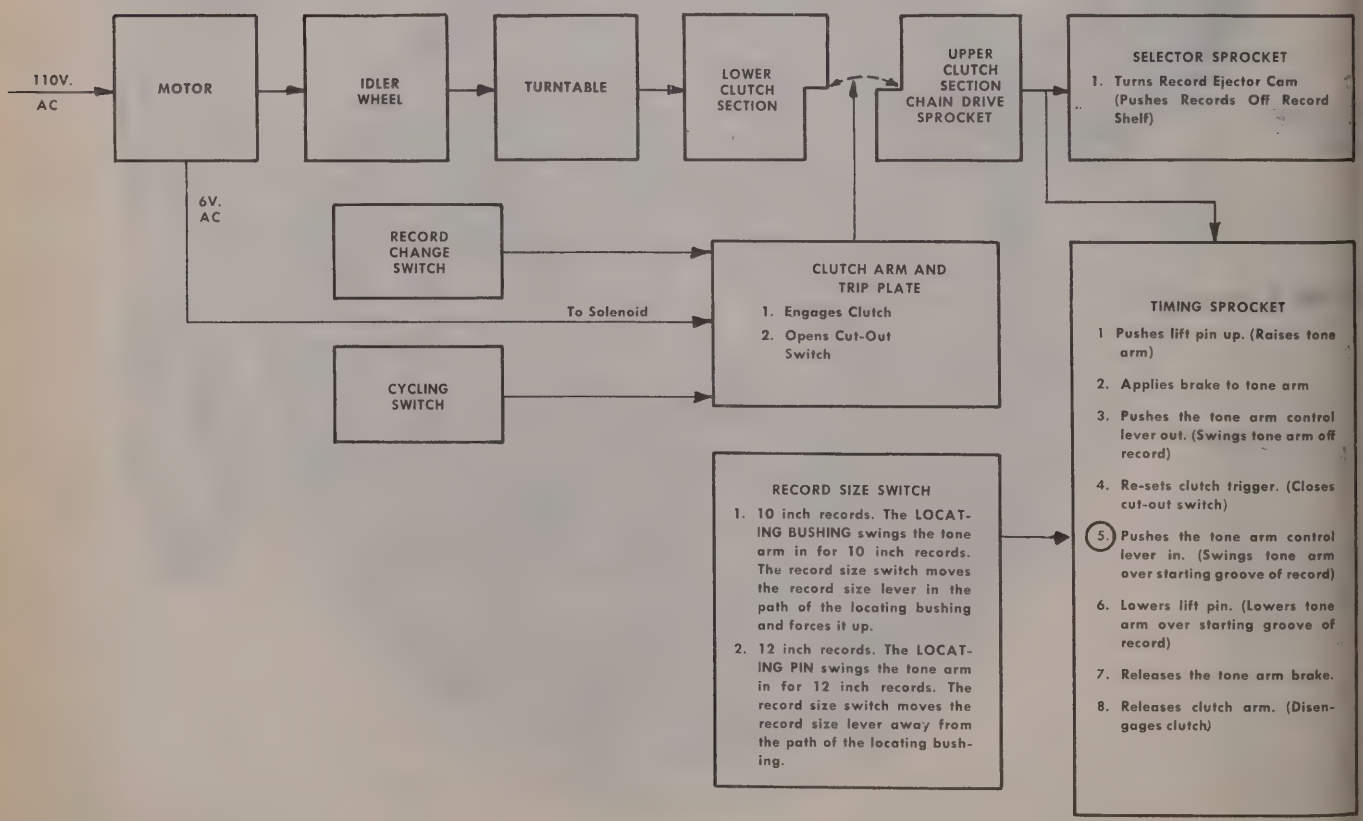

110V. AC
MOTOR
IDLER WHEEL
TURNTABLE
LOWER CLUTCH SECTION
UPPER CLUTCH SECTION CHAIN DRIVE SPROCKET
SELECTOR SPROCKET
1. Turns Record Ejector Cam (Pushes Records Off Record Shelf)
6V. AC
RECORD CHANGE SWITCH
To Solenoid
CYCLING SWITCH
CLUTCH ARM AND TRIP PLATE
1. Engages Clutch
2. Opens Cut-Out Switch
TIMING SPROCKET
1 Pushes lift pin up. (Raises tone arm)
2. Applies brake to tone arm
3. Pushes the tone arm control lever out. (Swings tone arm off record)
4. Re-sets clutch trigger. (Closes cut-out switch)
5. Pushes the tone arm control lever in. (Swings tone arm over starting groove of record)
6. Lowers lift pin. (Lowers tone arm over starting groove of record)
7. Releases the tone arm brake.
8. Releases clutch arm. (Disengages clutch)
RECORD SIZE SWITCH
1. 10 inch records. The LOCATING BUSHING swings the tone arm in for 10 inch records. The record size switch moves the record size lever in the path of the locating bushing and forces it up.
2. 12 inch records. The LOCATING PIN swings the tone arm in for 12 inch records. The record size switch moves the record size lever away from the path of the locating bushing.

Fig. 2. Sequence of Operation—Zenith Record Changers.

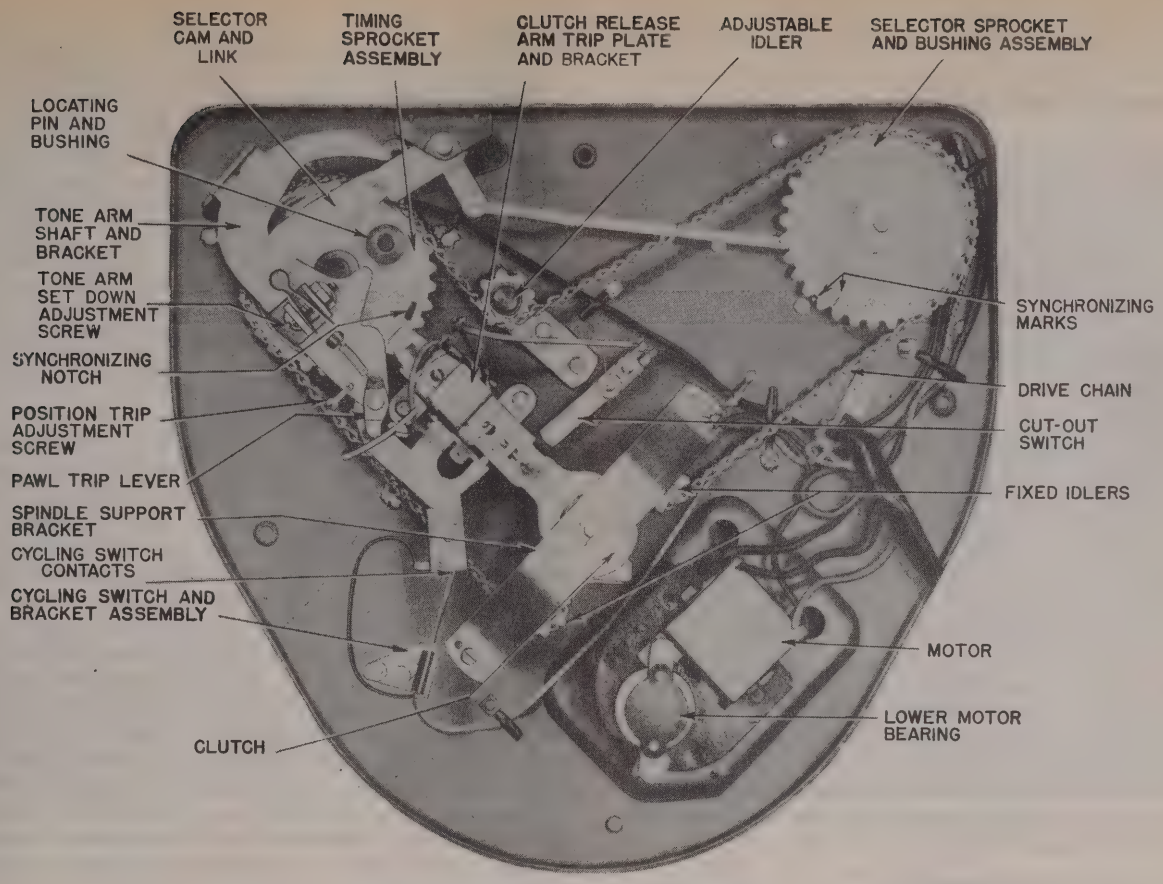
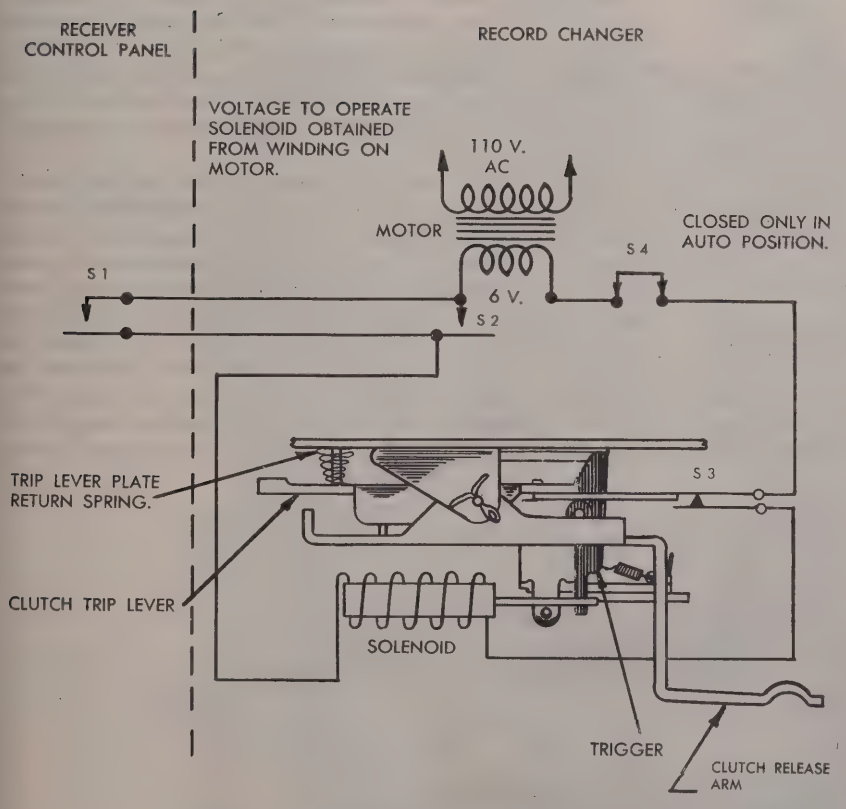


Fig. 3. Bottom View of Record Changer.



S1—Record Change Switch on Receiver Control Panel (Normally Open)
S2—Cycling Switch (Normally Open)
S3—Cut-Out Switch (Normally Closed)
S4—OFF-MAN-AUTO Switch (Closed in Auto Position)

Fig. 4. Electric Trip Circuit

The parallel switches S1 and S2 are in series with S3 and S4. Closing either S1 or S2 allows current flow through the solenoid, energizing it. When the solenoid is energized, the armature and trigger are pulled. This action releases the clutch trip lever and allows the trip lever plate spring to force the trip lever down against a stud on the clutch arm, raising the arm and engaging the clutch. The insulated strip which is riveted to the clutch trip lever operates the cut-out switch S3.

The clutch trip lever is re-set after one-half cycle by an emboss on the timing sprocket riding against the clutch trip lever. Re-setting of the clutch trip lever before the cycle is completed is possible because the clutch is held engaged by the tension of the timing sprocket against the tip of the clutch arm. The clutch cannot release until the timing sprocket travels completely around and the synchronizing notch slides underneath the tip of the clutch arm allowing it to drop through and release the clutch.

1. Tone Arm Set Down Adjustment.

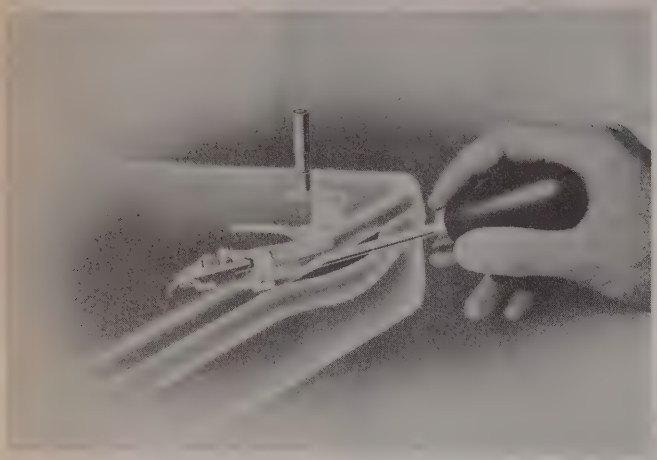


Fig. 5. Tone Arm Set Down Adjustment.

The Tone Arm Set Down Adjustment determines the landing position of the needle on the starting groove of the record. The adjustment screw can be reached with a screwdriver by pushing aside the trim strip (Fig. 5). The tone arm must be held in the rest position while the adjustment is made. Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

2. Tone Arm Height Adjustment.

The Tone Arm vertical rise is governed by the Lift Pin. The Lift Pin is adjustable (see Fig. 6). Too long a Lift Pin will cause the Tone Arm to hit the underside of the records on the Spindle. If the Lift Pin is short the needle will not clear twelve records on the Turntable. To make the proper adjustment, trip the Clutch by hand and rotate the Turntable clockwise until the Tone Arm starts to swing toward the Spindle. Gently push the Tone Arm as close to the Spindle as it will go, place a record on the Spindle and observe the spacing between it and the Tone Arm. The spacing "A" (Fig. 7), should be approximately the thickness of a record. If the spacing is incorrect, lift the Tone Arm, remove the Lift Pin, loosen the Lock Nut and adjust the Lift Pin to the proper length. Make certain that the Lock Nut is tightened after adjustment.

Fig. 6. Lift Pin.

3. Cycling Switch Adjustment.

When a record has completed its play and the needle enters the eccentric groove, Pawl "C" (Fig. 8) engages the Trip Plate "D," closing contacts "A" and completing the circuit through the solenoid which trips the record change mechanism.

To adjust the Cycling Switch, move the Tone Arm until Pawl "C" is clear of the Trip Lever Plate "D." Loosen the two Lock Screws "B," move the Cycling Switch bracket until there is approximately .03 inch spacing between contacts "A" and tighten the Lock Screws.

4. Position Trip Adjustment.

The Position Trip does not depend on an eccentric groove in the record to start the record change cycle, but will trip the mechanism whenever the needle comes within a pre-determined distance from the Spindle. Older type records without an eccentric groove can in most cases be played automatically by the proper adjustment of the Position Trip. Under normal conditions with the needle approximately 1 7/8" from the center of the Spindle adjust "E" (Fig. 8) until the contacts "A" close. This distance is generally satisfactory since no modern record will be cut off before it has completed its play, and none will fail to trip the mechanism at the end. In special cases screw the adjustment "E" clockwise for earlier tripping and counter-clockwise for later tripping as the individual cases may be.

It may be impossible to find an adjustment that will always trip the mechanism and never cut off on all type records, and in these special cases the record must be played manually.

5. Synchronization.

When the chain is removed or replaced, the selector sprocket must be synchronized with the timing sprocket. When the changer is properly timed, the synchronizing mark on the selector sprocket (see Fig. 3) will be in line with the mark on the base plate at the same time that the clutch release arm tip is in the timing sprockets synchronizing notch.

To synchronize, turn the timing sprocket until the clutch release arm tip drops into the synchronizing notch. The tip must not be pulled out of the notch during the remaining operations. Thread the chain over the drive sprocket, two fixed idlers, timing sprocket and the adjustable idler. Hold the loose end of the chain above the selector sprocket and turn this sprocket until the synchronizing mark is lined up with the mark in the base plate. The chain can now be threaded over the selector sprocket. Set the adjustable idler for medium tension on the chain, but be certain that the synchronizing marks are not pulled out of line. Tighten the lock screws after adjustment.

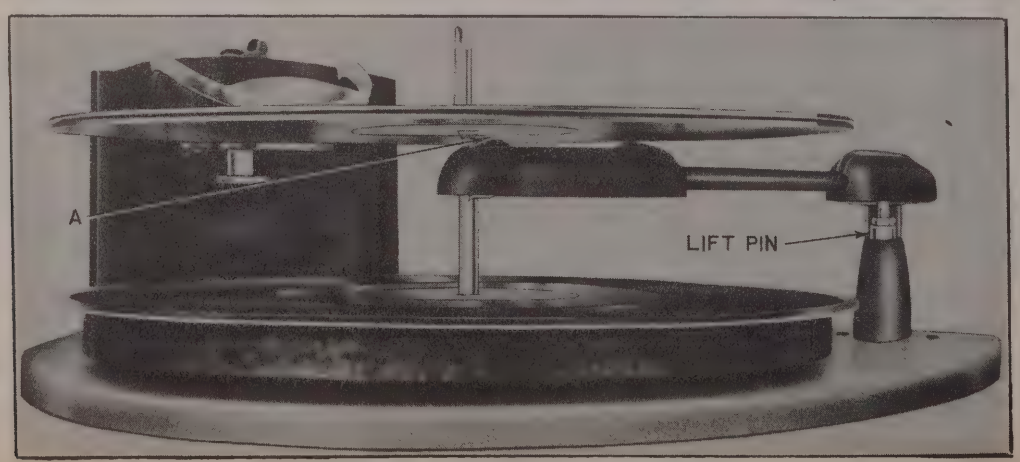


Fig. 7. Tone Arm Height Adjustment.

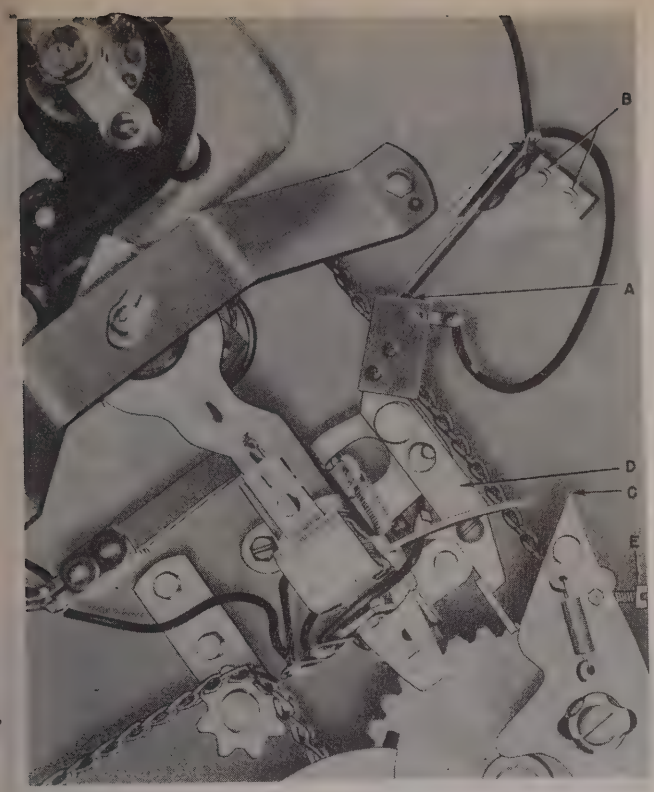


Fig. 8. Cycling Switch and Position Trip Adjustments.

LUBRICATION

Sta-Put grease No. 512 (light grease of the vaseline type) and light machine oil of No. 10 consistency are used for lubrication throughout.

Figures 9 and 10 indicate the points to be lubricated and the type of lubricant to use. The Motor has two oil wicks which should be saturated with oil. The Record Spindle Guide Bearing, Idler Wheel Bearing, Lower Drive Shaft Bearing, Drive Shaft Thrust Bearing and the Motor Bearings are of the OILITE type and require very little attention. If squeaks develop, be certain that they are not caused by friction between the Spindle and records on the Turntable, A thin coat of wax on the Spindle will remedy this condition.

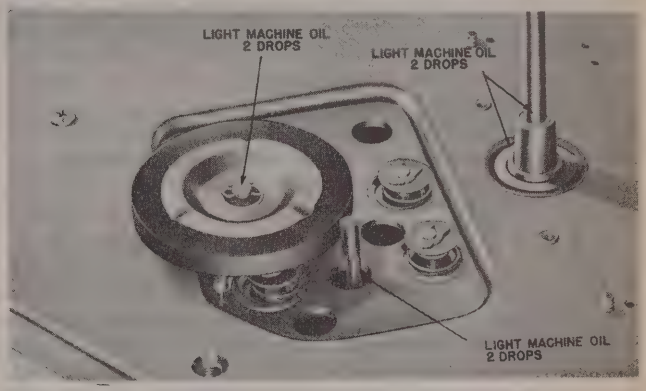


Fig. 9. Lubrication Top of Record Changer.

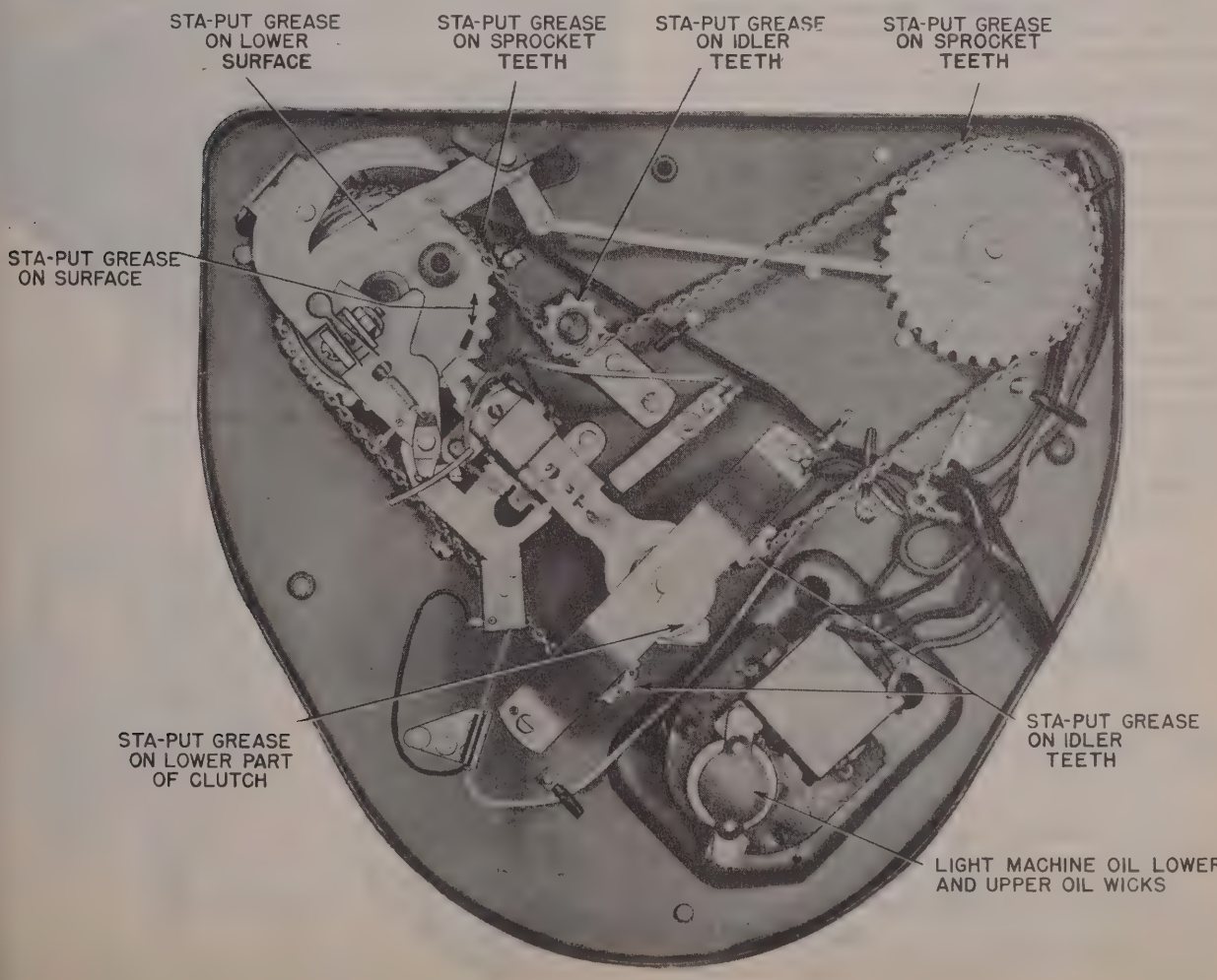


Fig. 10. Lubrication Bottom of Record Changer.

REMOVING THE TURNTABLE

To remove the Turntable, hold the Clutch with one hand and apply a twisting, pulling force to the turntable with the other hand (see Fig. 11).

To avoid damage when the Turntable is replaced, see that the Idler Wheel is pushed inside the rim before the Turntable is seated.

Fig. 11. Removing the Turntable.

REPLACING THE CHAIN

To replace the Chain, loosen the adjustable idler (Screws "D" Fig. 12) and remove the Chain. Open a link, and pull the Chain out. Open a link in the replacement Chain and thread it in place. Be certain that the open ends of the links face outward from the Base Plate (see Fig. 12). (This will prevent the Chain from being installed in reverse.) Carefully close the link in the new Chain and be certain that there is no stiffness in its action. Read the paragraph on synchronization before the Chain is permanently installed.

REPLACING THE MOTOR

Early models used the 141-92 and 141-94 motors. The 141-92 motor is unmarked while the 141-94 motor has "GI" stamped underneath the lower bearing support bracket. These motors are interchangeable except for the spring drive bushings. The 141-92 motor uses a 80-452 bushing for 50 cycle operation and a 80-453 bushing for 60 cycles. The 141-94 motor uses a 80-543 bushing for 50 cycles and a 80-549 bushing for 60 cycles. Later releases use a 141-104 motor for 60 cycle operation, and 141-103 motor for 50 cycle use. These motors can be used to replace the early models.

When a replacement Motor is ordered, include the line voltage and frequency of the receiver.

To replace the Motor, unsolder the connecting leads, remove the Turntable, the three "C" washers and allow the Motor to drop out. Remove the spring bushing from the shaft of the defective Motor by turning it against the direction of wind and re-install on the new one. When the new Motor is installed do not draw the connecting leads tight as this will prevent the Motor from "floating" on its spring mounts. Be certain that the "C" washers are crimped and the leads securely soldered and taped.

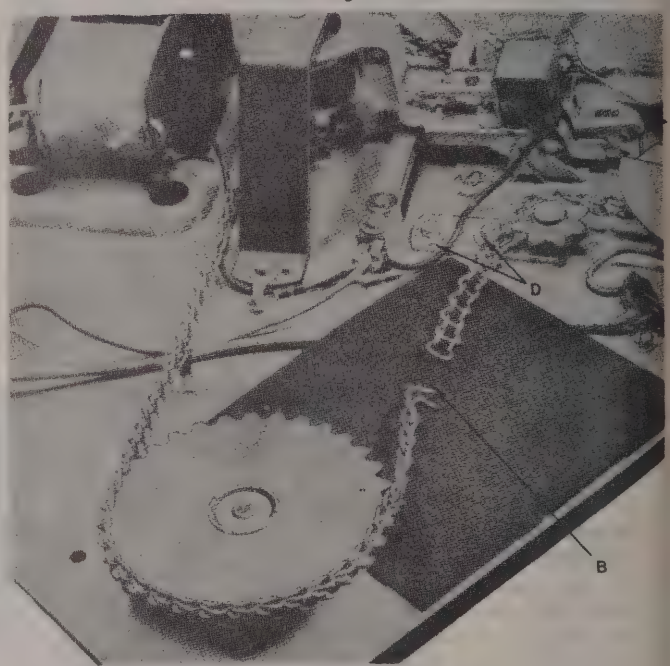


Fig. 12. Replacing the Chain.

TROUBLE SHOOTING

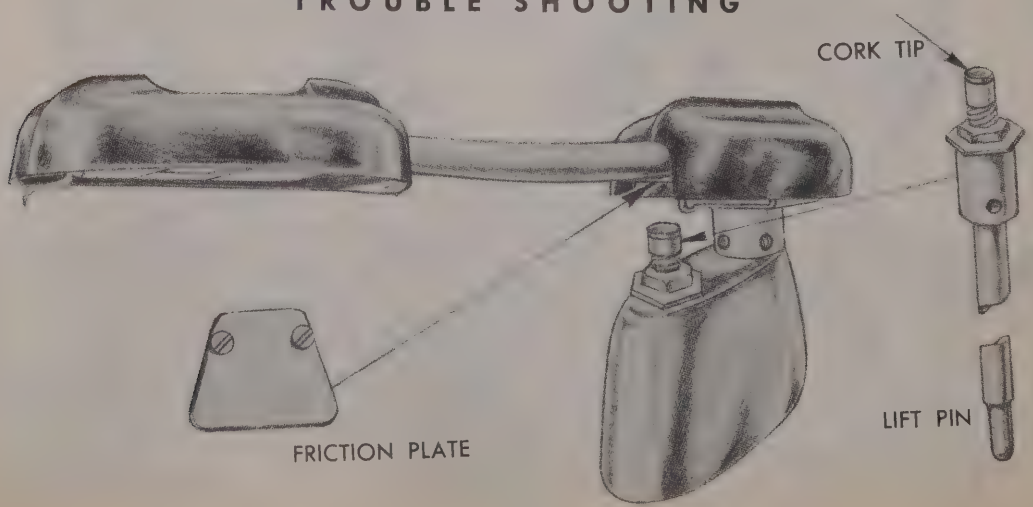


Fig. 13

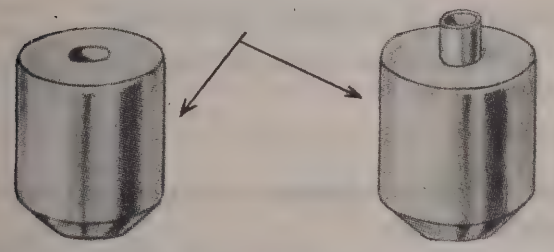
ERRATIC LANDING OF THE NEEDLE.

In the first production of S-11468 non-intermixer record changers, a neoprene cork tipped lift pin, part No. S-13056 was used to stabilize the set down or landing of the needle on the run-in groove of the record. The weight of the tone arm and the friction plate, riding on the neoprene tip of the lift pin was relied on to provide effective braking action. Grease or oil on the neoprene tip of the lift pin could cause erratic landing of the tone arm on the record. To remove the oil or grease, clean the pin tip and friction plate with carbon tetrachloride and roughen with fine sand paper.

Later production S-11468 changers have a spring type brake on the tone arm shaft and use an all metal lift pin, part No. S-13086.

Erratic landing, where the arm swings sharply to the center of the record or beyond, may be caused by the locating bushing. Replace with a 94-415 bushing.

LOCATING BUSHING



CORRECT **INCORRECT**

Fig. 14

TONE ARM SKIPS GROOVES AND REPEATS.

The vertical hinge on the tone arm may be too tight, causing the arm to hang slightly. This prevents the needle from exerting enough pressure on the record to follow the

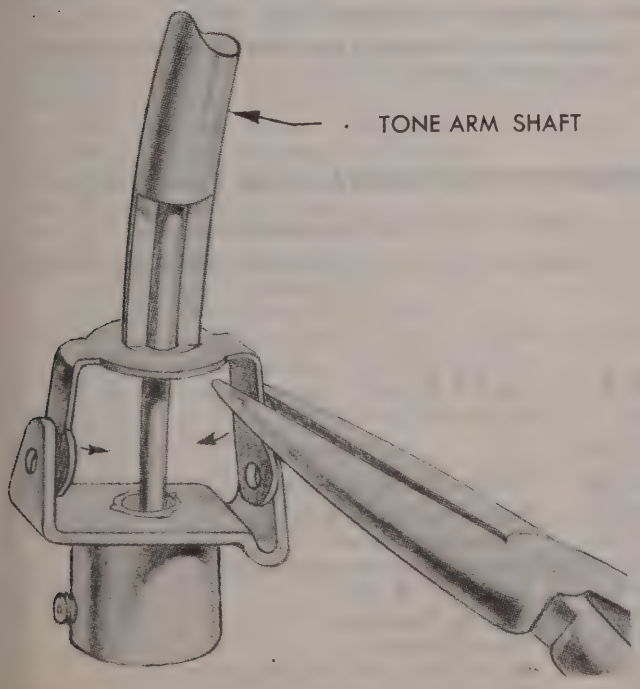


Fig. 15

record grooves. To free the hinge, use a pair of long nose pliers and bend the horizontal spring "U" bracket until it pivots freely. Be certain that the connecting lead to the crystal cartridge is dressed so that it does not interfere with either the vertical or horizontal movement of the tone arm. THIS IS IMPORTANT.

TONE ARM STICKS NEAR END OF RECORD.

Burrs on the trip pawl (Fig. 3) could cause the pawl to hang up in the ratchet. Remove the burrs with a sandstone.

LOOSE DRIVE BUSHING.

If the spring drive bushing runs partially off the motor shaft and scrapes the Turntable, apply a thin coat of speaker cement to the motor shaft and reinstall the bushing. Be very careful to wipe off all excess cement otherwise a rough surface may be formed which could cause rumble.

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

a. Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.

b. Check lubrication.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT.

a. Check line voltage and frequency.

b. Check lubrication.

c. Motor windings damaged.

d. Room temperature abnormally low.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START RECORD CHANGE CYCLE.

a. See that the AUTO-MAN-OFF switch is set to AUTO.

b. Check Record Change Switch.

c. Check Cut-out Switch.

d. Check electrical continuity of solenoid circuit.

e. Check solenoid energizing voltage on motor.

MOTOR FAILS TO RUN EVEN WHEN IT IS ENTIRELY DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING.

a. Open windings.

b. Damaged or frozen bearings.

c. Lower Bearing Support Bracket bent. Remove and straighten bracket—Re-center armature.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

a. Changer not "floated" properly. Loosen mounting bolts.

b. Motor mounting washers rubbing on the idler wheel.

c. Motor leads pulled tight preventing motor from "floating" freely on its springs.

d. Bump on Idler wheel.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES.

a. Cabinet tilted.

b. Badly worn or broken needle.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

a. Check Tone Arm height adjustment. (Adjustment 2.)

CHANGER CYCLES WITH AUTO-MAN-OFF SWITCH ON MAN.

a. Check AUTO-MAN-OFF switch.

b. Chain too tight.

c. Check Trigger Spring. (Fig. 4)

TONE ARM FALLS OFF RECORD.

a. Check Tone Arm set down adjustment. (Adjustment 1)

b. Check Tone Arm mounting screws.

c. Changer not level.

TONE ARM SET-DOWN POSITION VARIES.

a. Loose Tone Arm set down adjustment lock screw.

b. Loose Tone Arm mounting screw.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

a. See that the Phono Radio switch is on Phono.

b. Check receiver audio by listening to radio.

c. Check Crystal Cartridge.

d. Check Tone Arm Housing for broken leads.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

a. Check Tone Arm set down adjustment. (Adjustment 1).

CHANGER CONTINUES TO CYCLE.

a. Check Cycling switch adjustment. (Adjustment 3.)

b. Check Record Change switch.

c. Clutch release mechanism sticks.

d. Tight drive chain.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

a. See that the AUTO-MAN-OFF switch is set to AUTO.

b. Be certain the record has an eccentric center groove.

c. Check Cycling switch.

d. Check Cut-out switch. (Normally closed.)

e. Check Clutch Release Arm for freedom of action.

SQUEAKS WHEN CHANGER IS IN CYCLE.

a. Friction between Lift Pin and Timing Sprocket. Apply a thin coat of Sta-Put.

FAILS TO EJECT RECORDS ACCOMPANIED BY A CLICKING SOUND.

a. Clutch slips. A slight upward bend of the Clutch Release Arm will correct this condition.

TONE ARM STICKS OR HANGS UP DURING CYCLE.

a. Clutch Release Arm pressure on Timing Sprocket too great. Loosen the solenoid bracket and insert a very thin shim between it and the base plate. If the condition still prevails, increase the thickness of the shim.

b. Burrs in synchronizing notch or Clutch Release Arm Tip. Remove with a file.

MOTOR RUNS BUT TURNTABLE SLIPS OR STOPS.

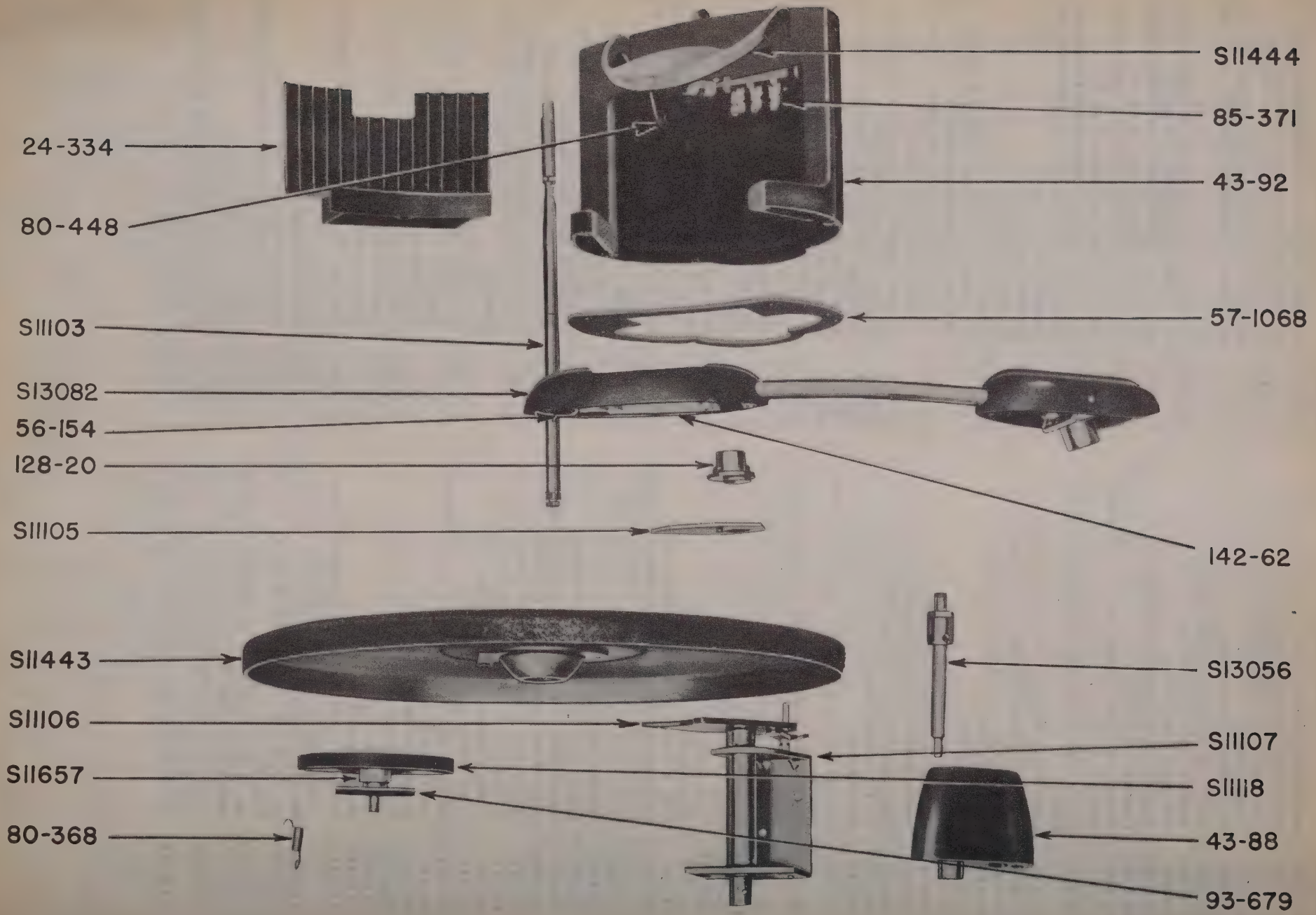
a. Turntable not fully seated. Tap gently.

b. Motor shaft slips on idler wheels. Check idler wheel.

NUMERICAL PARTS LIST

Part No.	Description
12-1228	10 and 12 inch Selector Stop Bracket.
12-1065	Record Spindle Support Bracket
19-123	Phono Frame Mounting Clips (3)
24-334	Record Ejector Housing Cover
27-67	Cork Tip for S-11100 and S-13056 Lift Pins
43-88	Tone Arm Support Housing
43-92	Record Ejector Housing
46-563	Record Selector Knob
52-318	Shielded Lead
54-30	8-32 x 5/16″ x 7/64″ Hex Nut—Steel N. P.
54-66	No. 10-32 x 5/16″ x 1/8″ Hex Nut—Steel N. P.
56-122	Record Selector Bracket Pin
56-128	Groove Pin (Sprocket Bushing)
56-143	Tone Arm Retaining Pin
56-154	Phonograph Needle
57-1068	Record Ejector Housing Plate
57-1247	Tone Arm Lift Plate
58-132	6 Prong Connector
64-259	Brass Eyelet N. P.
73-24	No. 8-32 x 1/4″ Hex Head Set Screw
73-71	No. 8-32 x 5/16″ Allen Head Set Screw—Steel Conepoint
73-72	No. 8-32 x 5/8″ Allen Head Set Screw—Ste Conepoint
73-86	No. 8-32 x 3/16″ Allen Head Set Screw

Part No.	Description
76-409	Record Ejector Cam Shaft
80-138	Idler Wheel Retaining Spring
80-317	Trip Lever Plate Return Spring
80-367	Toggle Spring
80-368	Idler Wheel Tension Spring
80-369	Record Spindle Compression Spring
80-384	Locating Stud Return Spring
80-406	Trip Lever Pawl Spring
80-407	Record Changer Mounting Springs
80-448	Pressure Arm Spring
80-452	Spring (50 Cycle Operation 141-92 Motor Shaft)
80-453	Spring (60 Cycle Operation 141-92 Motor Shaft)
80-458	Trip Contact Spring
80-460	Trip Lever Tension Spring
80-464	Pawl Spring
80-465	Contact Spring
80-466	Contact Spring
80-467	Trip Contact Spring
80-468	Motor Mounting Spring (2-End)
80-469	Motor Mounting Spring (Center)
80-472	Trip Lever Plate Actuating Spring
80-520	Lift Pin Holding Spring
80-531	Brake Spring
80-543	Spring (50 cycle operation 141-94 motor shaft)
80-549	Spring (60 cycle operation 141-94 motor shaft)
83-461	2 Lug Terminal Strip
83-1091	Insulating Strip
83-1107	Insulator Strip
83-1346	3 Lug Terminal Strip
85-371	3 Position Slide Switch
93-35	3/8" x .144 x .032" Flat Washer—N. P.
93-126	No. 8 Internal Shakeproof Lockwasher No. 1208
93-487	1/16" x .144 x 3/8" Steel Washer—Cad. Pl.
93-582	.025 x .129 x 5/16" Flat Washer—Cad. Pl.
93-617	Sprocket Shaft Retaining Washer
93-673	Idler Wheel Stud Washer—Threaded
93-677	Idler Wheel Stud Fishpaper Washer (large)
93-678	Idler Wheel Stud Fishpaper Washer (small)
93-679	Idler Wheel Stud Felt Washer (large)
93-719	7/16 x 3/16" x .031" Flat Washer—N. P.
93-764	Spring Washer—Shakeproof No. 3759-14
93-819	Motor Mounting Flat Washer
93-821	Spring Washer—Spring Mount Timing Sprocket
94-415	Locating Bushing
94-505	Insulated Bushing
97-213	Motor Mounting Stud
112-378	Needle Holding Screw
112-413	Weight Lever Pivot Screw
112-415	No. 8-32 x 3/8" Flat Head Shakeproof Type 1 —Self Tapping Screw—Steel Cad.
112-420	Record Changer Mounting Screw
112-450	No. 4-40 1/8" Phillips Binding Hd. M. S. Steel Cad. Pl.
112-562	No. 4-40 x 7/8" R.H. "STAN-TAP" Self Tapping Screw—Cad. Pl.
112-563	No. 8-32 x 1/4" Recessed Stove H.M.S.—Steel —Bronze Pl.
112-578	No. 6-32 x 1/4" Oval V.H.M.S.—Steel N. P.
112-579	No. 8-32 x 3/8" R.H. Shakeproof Type 1— Self Tapping Screw—Steel Cad. Pl.
112-614	Lift Pin Spring Holding Screw
114-192	No. 6-20 x 7/16" Hex. Hd. Slotted Self Tapping Screw—Shakeproof Type 25—Steel Cad. Pl.
114-200	No. 6-32 x 5/16" Hex Head Slotted "STAN-TAP" Self Tapping Screw—Cad. Pl.
114-201	No. 8-32 x 5/16" Hex Head Slotted "STAN-TAP" Self Tapping Screw—Cad. Pl.
114-217	No. 8-32 x 1/4" Hex Head Slotted "STAN-TAP" Self Tapping Screw—Cad. Pl.
114-253	No. 6-20 x 3/8" Hex Head Slotted Shakeproof (Type 25) Self Tapping Screw—Steel—Cad.
117-85	Record Selector Lever
117-106	Position Trip Lever
128-20	Record Ejector Cam
141-92/94	Phono Motors (Early Models)
141-103	50 cycle Phono Motor (Replaces 141-92 or 141-94 on 50 Cycle current)
141-104	60 cycle Phono Motor (Replaces 141-92 or 141-94 on 60 Cycle current)
142-62	Crystal Cartridge
166-29	Pressure Bar Rubber Bumper
188-27	Record Spindle Retaining Washer
188-32	Motor Mounting "C" Washer
188-55	Selector Coupling Arm Retaining Washer
214-1	Sprocket Drive Chain
S-10730	Timing Sprocket Assembly
S-10732	Idler Assembly
S-10753	Tone Arm Pivot Shaft and Bracket Assembly
S-11103	Record Spindle Assembly
S-11104	Turntable
S-11105	Record Ejector Plate and Pin Assembly
S-11106	Record Support Plate—Shaft and Pin Assembly
S-11107	Record Support and Ejector Bracket Assembly
S-11109	Selector Sprocket and Bushing Assembly
S-11110	Selector Cam and Link Assembly
S-11118	Idler Wheel Assembly
S-11441	Record Changer Lever and Stud Assembly
S-11444	Record Pressure Arm Assembly
S-11458	Solenoid and Bracket Assembly (Part of S-11599)
S-11580	Trip Contact and Support Strip Assembly
S-11599	Clutch Release Arm—Trip Plate and Bracket Assembly
S-11604	Trip Contact Assembly
S-11608	Base Plate Sprocket and Drive Shaft Bearing Assembly
S-11657	Idler Stud and Washer Assembly
S-11951	Cable and Plug Assembly
S-12010	Tone Arm only (less parts)
S-12333	Cable and Plug Assembly
S-12489	Tone Arm Pivot Shaft and Bracket Assembly
S-12541	Contact Assembly
S-12542	Contact Assembly
S-12891	Trip Contact and Bracket Assembly
S-13080	Tone Arm Swivel Bracket and Bushing Assembly
S-13082	Tone Arm complete
S-13086	Tone Arm Lift Pin Assembly
S-13134	Power Input Cable for testing Record Changers
S-13196	Cable and Plug Assembly


S11444
85-371
43-92
24-334
80-448
S11103
57-1068
S13082
56-154
128-20
S11105
142-62
S11443
S13056
S11106
S11107
S11657
S11118
80-368
43-88
93-679

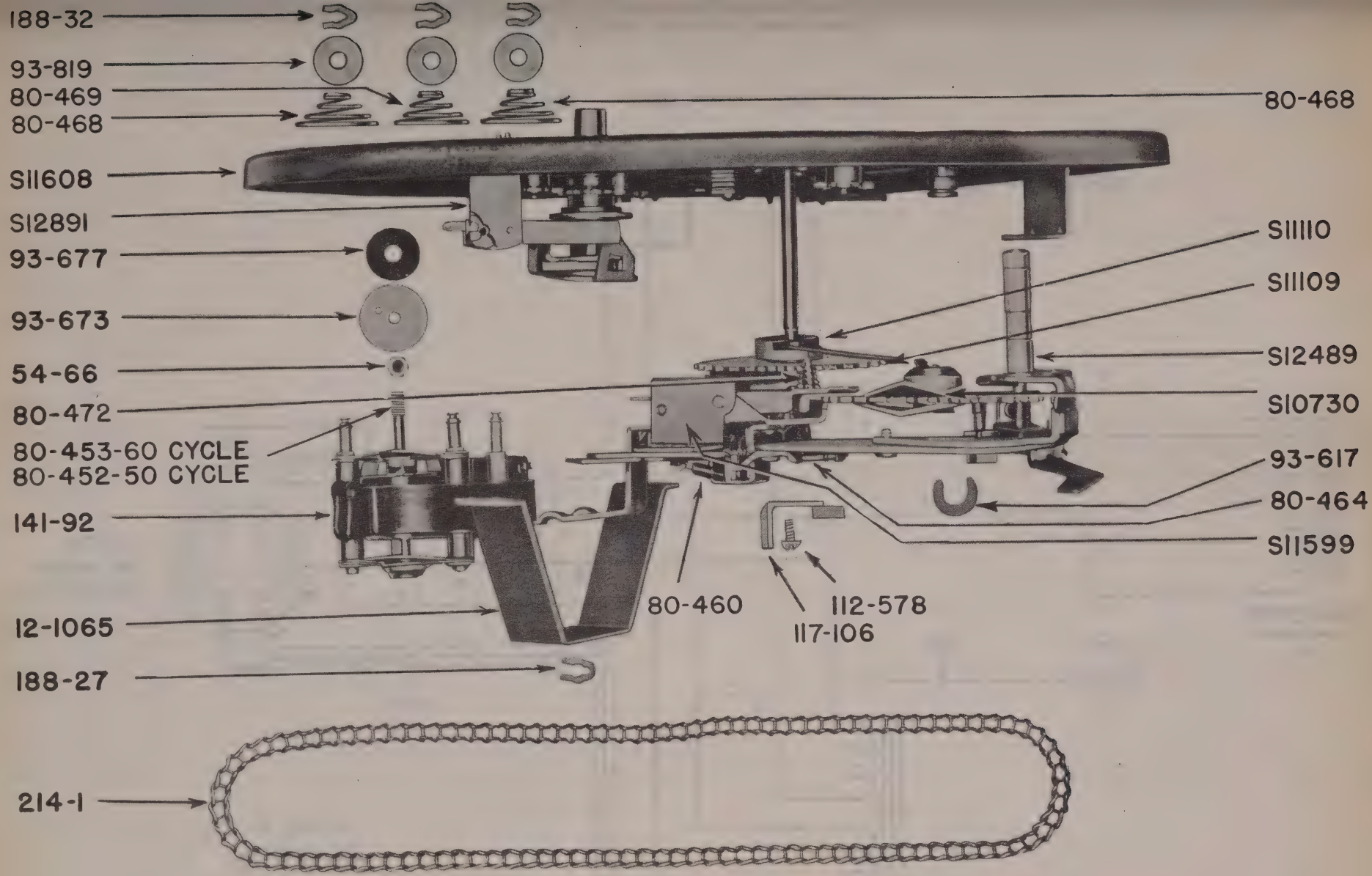


Fig. 16 Exploded View of Record Changer.

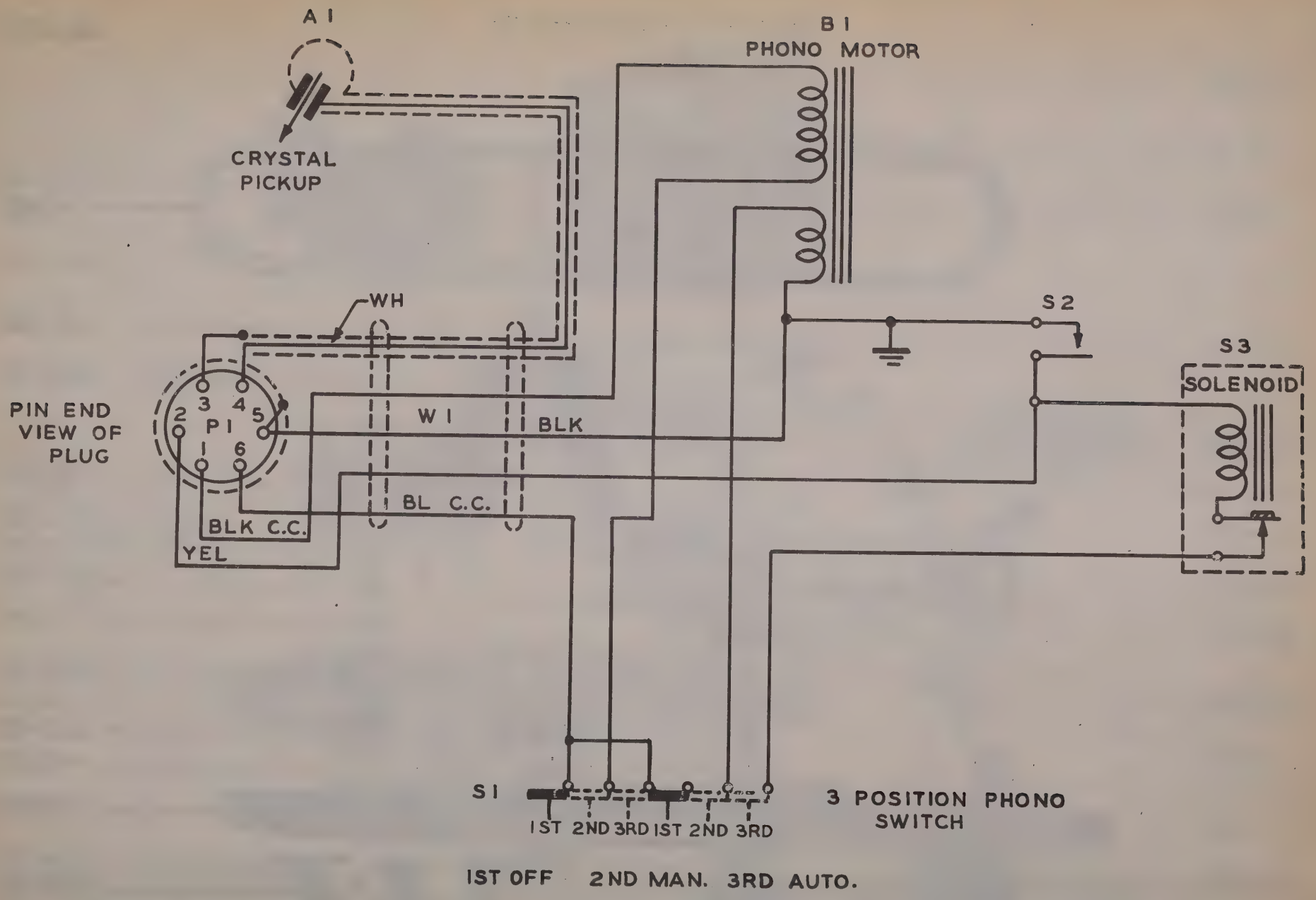


Fig. 17. Schematic Diagram of Record Changer

Printed in U.S.A. 10M 4-15-47

SERVICE MANUAL

MODEL S-11680

AUTOMATIC RECORD CHANGER

ZENITH RADIO CORPORATION

CHICAGO 39, ILLINOIS, U. S. A.

rm Z02F

TO THE SERVICE MAN:

This Service Manual has been prepared for the purpose of assisting the Service Man in his work of caring for the Record Changer mechanism, whether he is called to remedy some difficulty, or to insure the continued satisfactory operation. The Zenith Automatic Record Changers are constructed with a minimum of working parts, and in operation are simple and reliable. However, as is the case with all mechanical units, misalignment and trouble may occasionally develop. The information presented in this book will enable the Service Man to render quick and accurate service. For convenience, the Operating Instructions supplied with each Record Changer are summarized as follows:

The Record Changer will automatically play up to fourteen 10 inch or twelve 12 inch records at one loading, or up to twelve 10 and 12 inch records intermixed. The Record Stack rests on the Spindle and the Record Shelf. The Selector Sprocket drives the Ejector Cam which pushes the records off the Shelf and Spindle allowing them to drop on the Turntable. To load for automatic operation, swing the Pressure Bar to the right, place the stack of records on the Spindle, swing the Pressure Bar to the left until it rests on the record stack, set the OFF-MAN-AUTO switch to AUTO and press the Record Change button. The Changer will play the entire selection of records and will repeat the last record until it is turned off. For manual operation set the OFF-MAN-AUTO switch to MAN and play the records singly as on a non-automatic record player.

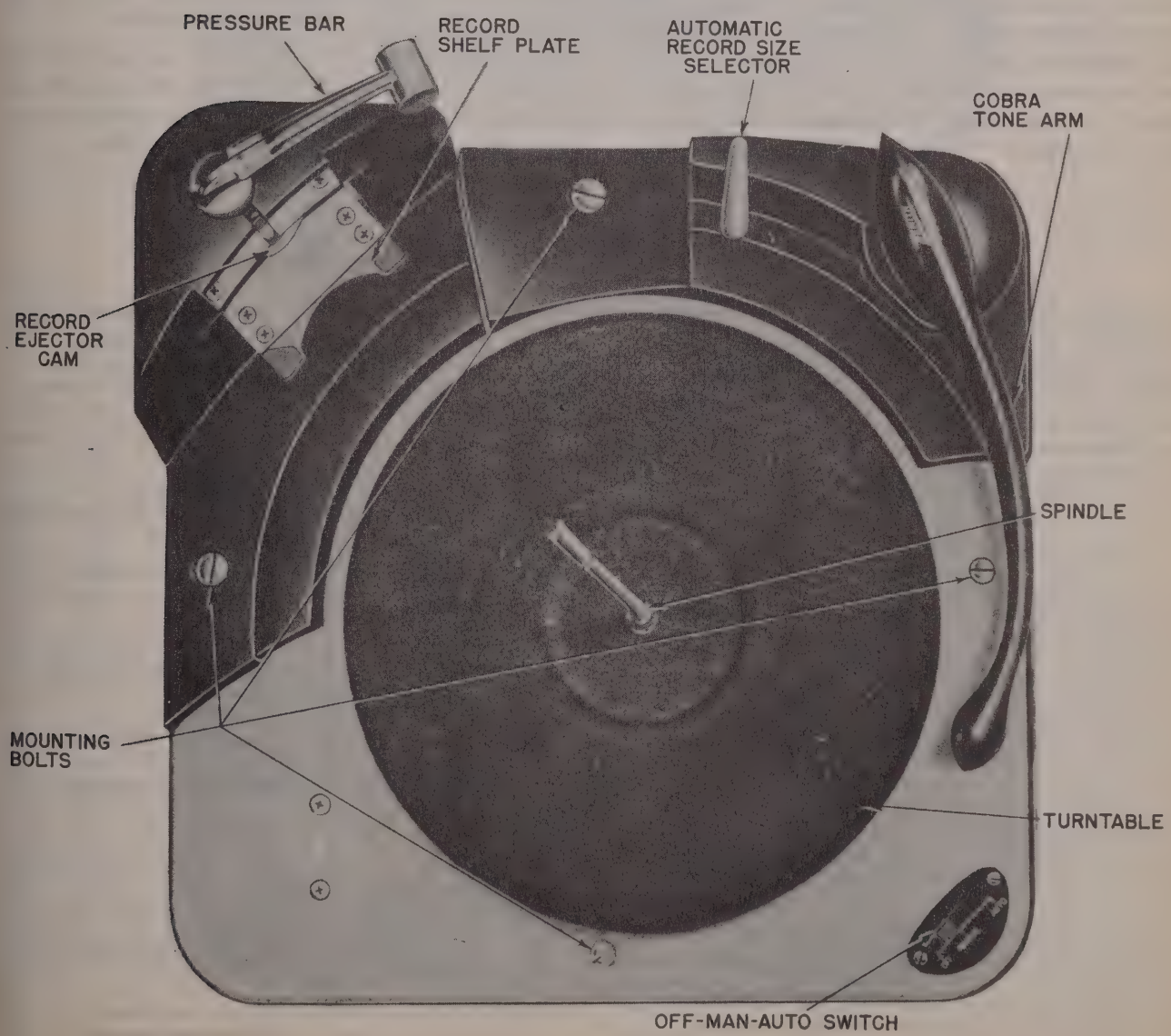


Fig. 1. Top View of Record Changer.

DESCRIPTION OF CYCLING

The motor drives an idler wheel which rim drives the turntable and the lower clutch section. The spindle is fixed and does not turn with the turntable. The solenoid energizing voltage is obtained from a 6 volt winding on the motor.

When the record change button on the receiver panel is pressed, the electric trip circuit is completed, solenoid is energized and the trigger pulled. (Fig. 4.) When the trigger is pulled, the trip plate return spring forces the trip plate down and opens the cut-out switch. The trip plate hits a stud on the clutch arm, raises the arm, engages the clutch, and closes the muting switch. When the clutch is engaged, the chain drive sprocket is set into motion and drives the chain, selector sprocket and the timing sprocket. Through 360° rotation the timing sprocket has eight functions which are as follows: 1. Raises the lift pin and tone arm off the record. The lift pin is in the groove of the timing sprocket when it is down and on the surface when up. 2. An emboss applies the brake to the tone arm. The brake consists of a friction plate which is pressed against the tone arm control lever to prevent coasting and erratic landing. 3. The locating pin hits the tone arm control lever and swings the tone arm laterally off the record. 4. The emboss resets the clutch trigger mechanism and closes the cut-out switch. 5. The locating pin swings the tone arm when a 12 inch record is played. On 10 inch records, the tone arm must swing an additional inch nearer the spindle and the greater diameter bushing, which is pushed upward by the record size lever, rides against the tone arm control lever. 6. Lift pin rides into the groove and lowers the tone arm over the starting groove of the record. 7. The emboss releases the brake. 8. Tip of the clutch arm drops into the synchronizing notch and releases the clutch arm, disengages the clutch and opens the muting switch.

The selector sprocket operates the record ejector plate and is timed with the timing sprocket to drop the record on the turntable when the tone arm is at its greatest outward swing. This is immediately after the number 3 function of the timing sprocket.

When the record is playing, the tone arm is moving toward the center of the record and the pawl on the tone arm control lever is moving toward the cycling switch trip lever ratchet. As the pawl enters the ratchet, the oscillating action, produced by the eccentric groove on the record, causes the cycling switch to close, complete the circuit through the solenoid and repeat the cycle. If the record does not have an eccentric groove, the position trip will close the cycling switch and start the next cycle.

During the record change cycle, the muting switch S4 connects C1 across the output of the pre-amp. The low reactance of C1 by-passes the audio to ground and makes the amplifier inoperative during the change cycle.

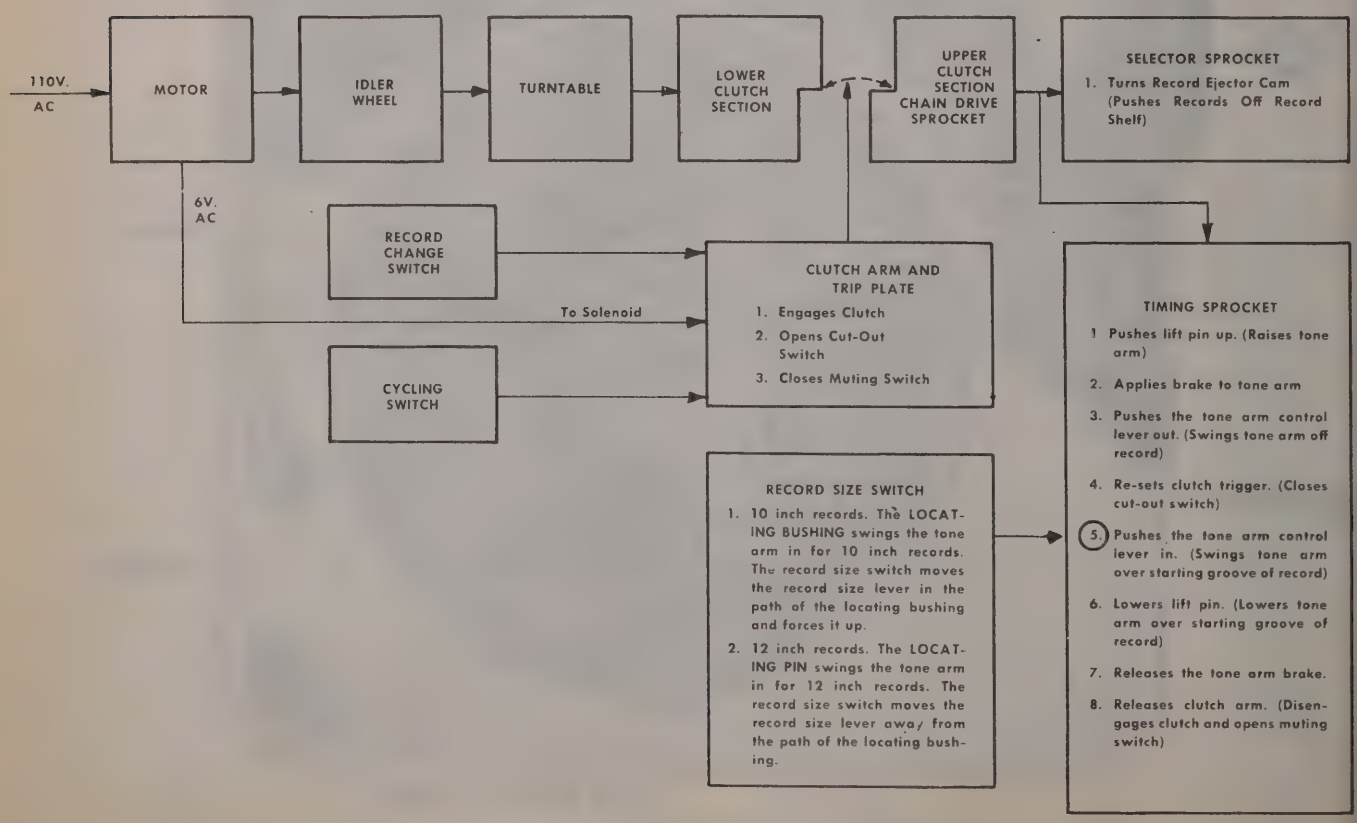

110V. AC
MOTOR
IDLER WHEEL
TURNTABLE
LOWER CLUTCH SECTION
UPPER CLUTCH SECTION CHAIN DRIVE SPROCKET
SELECTOR SPROCKET
1. Turns Record Ejector Cam (Pushes Records Off Record Shelf)
6V. AC
RECORD CHANGE SWITCH
To Solenoid
CYCLING SWITCH
CLUTCH ARM AND TRIP PLATE
1. Engages Clutch
2. Opens Cut-Out Switch
3. Closes Muting Switch
TIMING SPROCKET
1 Pushes lift pin up. (Raises tone arm)
2. Applies brake to tone arm
3. Pushes the tone arm control lever out. (Swings tone arm off record)
4. Re-sets clutch trigger. (Closes cut-out switch)
5. Pushes the tone arm control lever in. (Swings tone arm over starting groove of record)
6. Lowers lift pin. (Lowers tone arm over starting groove of record)
7. Releases the tone arm brake.
8. Releases clutch arm. (Disengages clutch and opens muting switch)
RECORD SIZE SWITCH
1. 10 inch records. The LOCATING BUSHING swings the tone arm in for 10 inch records. The record size switch moves the record size lever in the path of the locating bushing and forces it up.
2. 12 inch records. The LOCATING PIN swings the tone arm in for 12 inch records. The record size switch moves the record size lever away from the path of the locating bushing.

Fig. 2. Sequence of Operation—Zenith Record Changers.

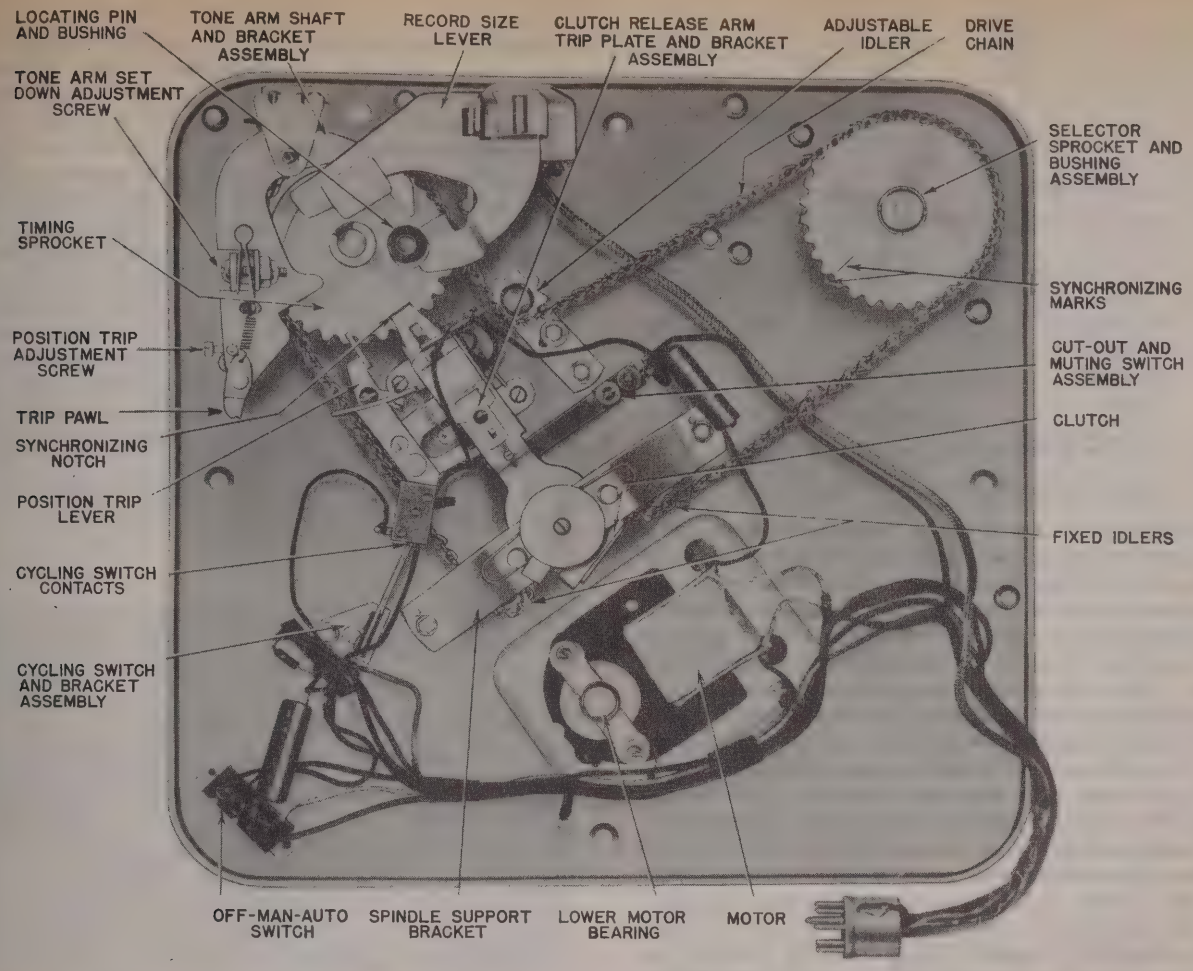
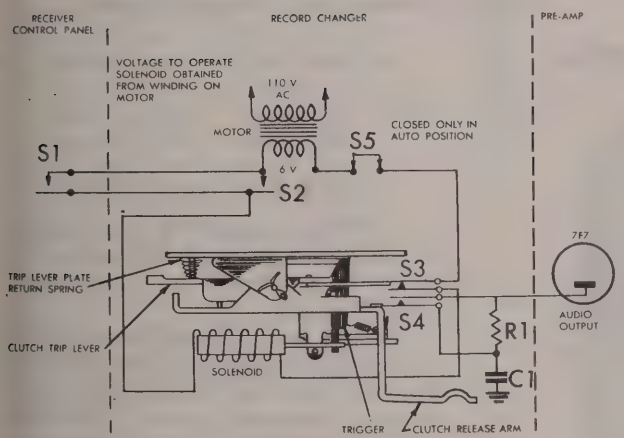


Fig. 3. Bottom View of Record Changer.



S1—Record Change Switch on Receiver Control Panel (Normally Open)
S2—Cycling Switch (Normally Open)
S3—Cut-Out Switch (Normally Closed)
S4—Muting Switch (Normally Open)
S5—OFF-MAN-AUTO Switch (Closed in Auto Position)

Fig. 4. Electric Trip Circuit

The parallel switches S1 and S2 are in series with S3 and S5. Closing either S1 or S2 allows current flow through the solenoid causing it to become energized. When the solenoid is energized, the armature and trigger are pulled. This action releases the clutch trip lever and allows the trip lever plate spring to force the trip lever down against a stud on the clutch arm, raising the arm and engaging the clutch. The insulated strip which is riveted to the clutch trip lever operates the cut-out switch S3. The muting switch S4 is operated by the clutch arm.

The clutch trip lever is reset after one-half cycle by an emboss on the timing sprocket which rides against the clutch trip lever Resetting of the clutch trip lever before the cycle is completed is possible because the clutch is held engaged by the tension of the timing sprocket against the tip of the clutch arm. The clutch cannot release until the timing sprocket travels completely around and the synchronizing notch slides underneath the tip of the clutch arm allowing it to drop through and release the clutch.

THEORY OF THE COBRA RADIONIC PICKUP

The operation of the Cobra pickup is considerably different from Crystal and Dynamic pickups. These pickups generate audio power, while the Cobra controls power generated by a radio frequency oscillator. The 7F7 twin triode tube is a modulated oscillator, detector and audio amplifier. The oscillator operates at a frequency of 2.5 Mc. Modulation is accomplished by changing the energy losses in a tuned circuit. These losses may be represented by an equivalent resistance in series with the reactance of the coil. The ratio of the resistance to the reactance determines the efficiency or Q of the coil. The amplitude of the RF voltage developed across this coil by an oscillator will vary with changes in Q.

The grid coil L_1 and other components of the oscillator are mounted in the oscillator pre-amp chassis, while the plate coil L_2 is in the Needle Cartridge with the vane and needle assembly. The coil is fixed and has 40 turns of No. 40 wire (approximate DC resistance 2½ ohms). The stainless steel vane, which is in the field of the coil, is spot welded to the osmium-iridium tipped stylus.

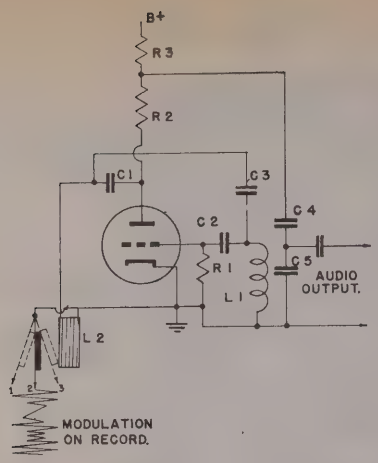


Fig. 5. Simplified Circuit of Oscillator.

Any movement of the stylus will cause a corresponding movement of the vane. As the stylus and vane follow the modulations in the record, changes in the mutual inductance between the vane and coil occur (see Fig. 5). In position 2 the vane is at rest, and a constant RF voltage appears across the plate coil. As the vane is set in motion and reaches position 1, it is at its greatest outward swing from the coil, resulting in low mutual inductance, low reflected resistance, higher Q, and a higher RF voltage across the coil. In position 3 it is at its greatest inward swing; resulting in a high mutual inductance, high reflected resistance, lower Q and a lower RF voltage. It can be seen that the amplitude of the RF voltage which appears across the coil will vary with changes in Q, satisfying the condition for amplitude modulation. The position of the vane changes both the Q and L of the coil. Changes in L shift the frequency slightly, and a certain amount of frequency modulation is present, but since there is no frequency discrimination it remains undetected.

Since the grid and plate coils are part of a single tuned circuit any variations of amplitude of the RF voltage brought about by the changes in Q across the plate coil will also appear across the grid Coil L_1 causing a shift in the average plate current through the plate load resistor across which the audio output voltage is developed. Plate bend detection takes place since only the positive half of the grid swing causes an increase in the average plate current. These changes in the average plate current appear as audio voltage across the plate load resistor.

The 2.5 Mc. RF voltage and the audio voltage both appear at the plate (pin 6) of the oscillator triode. R_2, C_4 and C_5 filter out the RF voltage allowing only the audio component to the grid (pin 4) of the amplifier triode where it is amplified, fed through a shielded lead to the audio amplifier of the receiver and reproduced by the loudspeaker.

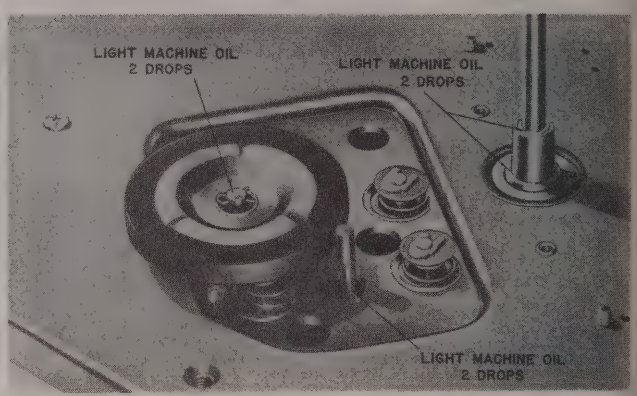


Fig. 6. Lubrication Top of Record Changer.

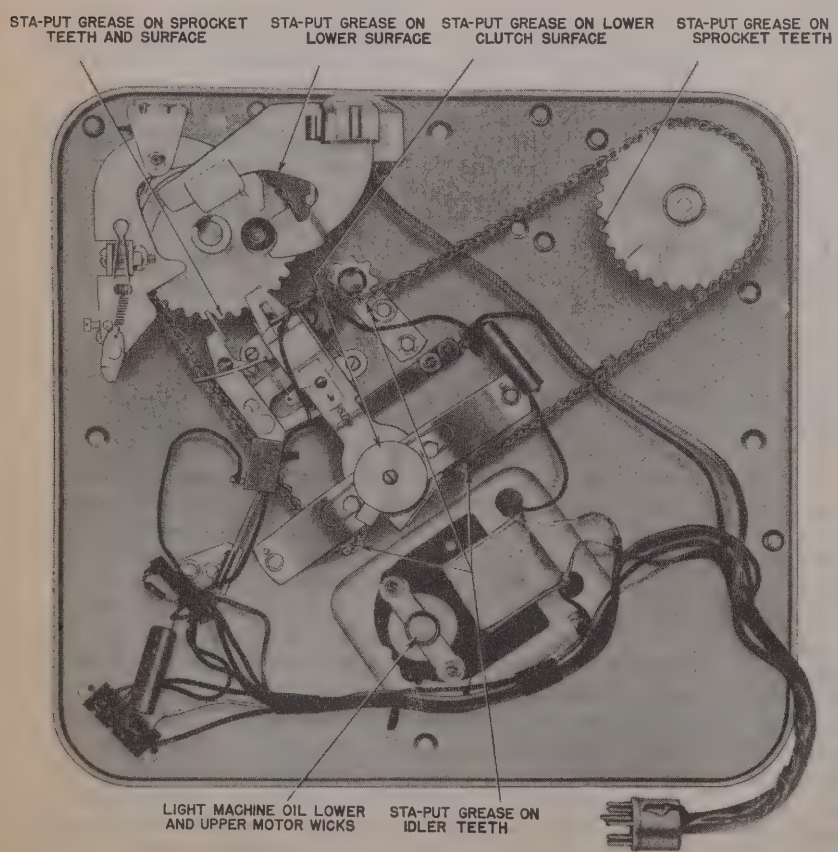

STA-PUT GREASE ON SPROCKET TEETH AND SURFACE
STA-PUT GREASE ON LOWER SURFACE
STA-PUT GREASE ON LOWER CLUTCH SURFACE
STA-PUT GREASE ON SPROCKET TEETH
LIGHT MACHINE OIL LOWER AND UPPER MOTOR WICKS
STA-PUT GREASE ON IDLER TEETH

Fig. 7. Lubrication Bottom of Record Changer.

LUBRICATION

Sta-Put grease No. 512 (light grease of the vaseline type) and light machine oil of No. 10 consistency are used for lubrication throughout.

Figures 6 and 7 indicate the points to be lubricated and the type of lubricant to use. The Motor has two oil wicks which should be saturated with oil. The Record Spindle Guide Bearing, Idler Wheel Bearing, Lower Drive Shaft Bearing, Drive Shaft Thrust Bearing and the Motor Bearings are of the OILITE type and require very little attention. If squeaks develop, make certain that they are not caused by friction between the Spindle and records on the Turntable. A thin coat of wax on the Spindle will remedy this condition.

1. Tone Arm Set Down Adjustment.

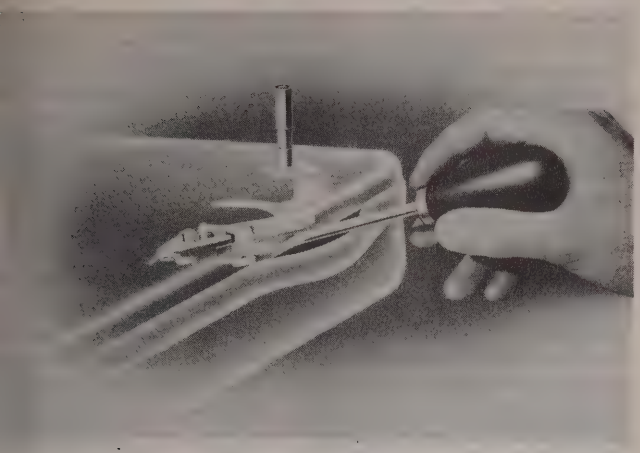


Fig. 8. Tone Arm Set Down Adjustment.

The Tone Arm Set Down Adjustment determines the landing position of the needle on the starting groove of the record. The adjustment screw can be reached with a screwdriver by pushing aside the trim strip (Fig. 8). The tone arm must be held in the rest position while the adjustment is made. Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

2. Tone Arm Height Adjustment.

The Tone Arm vertical rise is governed by the Lift Pin. The Lift Pin is adjustable (see Fig. 9). Too long a Lift Pin will cause the Tone Arm to hit the underside of the records on the Spindle. If the Lift Pin is short the needle will not clear fourteen records on the Turntable. To make the proper adjustment, trip the Clutch by hand and rotate the Turntable clockwise until the Tone Arm starts to swing toward the Spindle. Gently push the Tone Arm as close to the Spindle as it will go, place a record on the Spindle and observe the spacing between it and the Tone Arm. The spacing "A" (Fig. 10), should be approximately the thickness of a record. If the spacing is incorrect, lift the Tone Arm, remove the Lift Pin, loosen the Lock Nut and adjust the Lift Pin to the proper length. Be certain that the Lock Nut is tightened after adjustment.

Fig. 9. Lift Pin.

3. Cycling Switch Adjustment.

When a record has completed its play and the needle enters the eccentric groove, Pawl "C" (Fig. 11) engages the Trip Plate "D," closing contacts "A" and completing the circuit through the solenoid which trips the record change mechanism.

To adjust the Cycling Switch, move the Tone Arm until Pawl "C" is clear of the Trip Lever Plate "D" (as shown in Fig. 11). Loosen the two Lock Screws "B," move the Cycling Switch bracket until there is approximately .03 inch spacing between contacts "A" and tighten the Lock Screws.

4. Position Trip Adjustment.

The Position Trip does not depend on an eccentric groove in the record to start the record change cycle, but will trip the mechanism whenever the needle comes within a pre-determined distance from the Spindle. Older type records that do not have an eccentric groove can in most cases be played automatically by the proper adjustment of the Position Trip. Under normal conditions with the needle approximately 1⅞" from the center of the Spindle adjust "E" (Fig. 11) until the contacts "A" close. This distance is generally satisfactory since no modern record will be cut off before it has completed its play, and none will fail to trip the mechanism at the end. In special cases screw the adjustment "E" clockwise for earlier tripping and counter-clockwise for later tripping as the individual cases may be.

It may be impossible to find an adjustment that will always trip the mechanism and never cut off on all type records, and in these special cases the record must be played manually.

5. Synchronization.

When the chain is removed or replaced, the selector sprocket must be synchronized with the timing sprocket. When the changer is properly timed, the synchronizing mark on the selector sprocket (see Fig. 3) will be in line with the mark on the base plate at the same time that the clutch release arm tip is in the timing sprockets synchronizing notch.

To synchronize, turn the timing sprocket until the clutch release arm tip drops into the synchronizing notch. The tip must not be pulled out of the notch during the remaining operations. Thread the chain over the drive sprocket, two fixed idlers, timing sprocket and the adjustable idler. Hold the loose end of the chain above the selector sprocket and turn this sprocket until the synchronizing mark is lined up with the mark in the base plate. The chain can now be threaded over the selector sprocket. Set the adjustable idler for medium tension on the chain, but be certain that the synchronizing marks are not pulled out of line. Tighten the lock screws after adjustment.

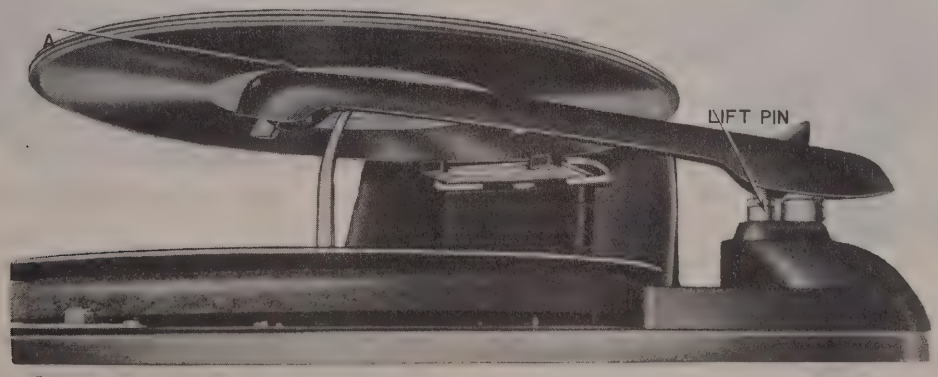


Fig. 10. Tone Arm Height Adjustment.

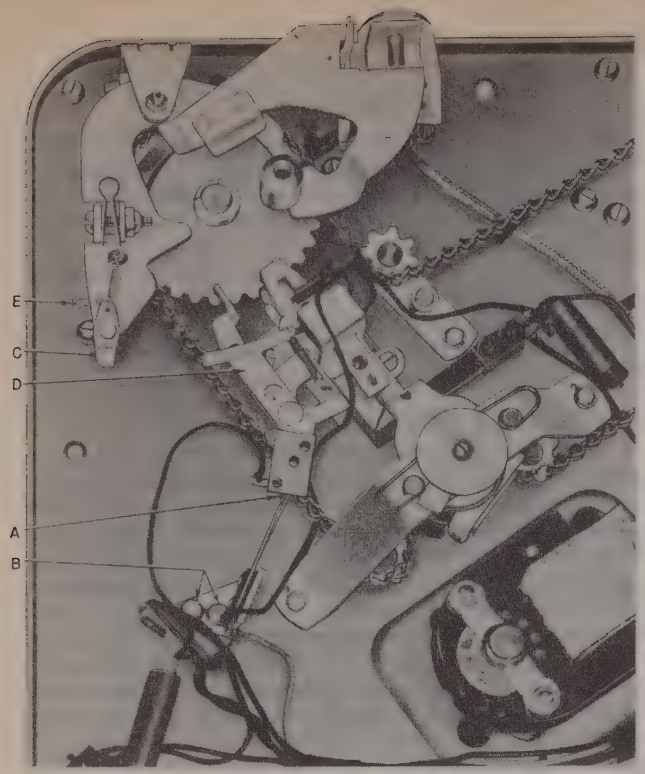


Fig. 11. Cycling Switch and Position Trip Adjustments.

REMOVING THE TURNTABLE

To remove the Turntable, hold the Clutch with one hand and turn the Turntable with the other (see Fig. 12).

To avoid damage when the Turntable is replaced, be certain that the Idler Wheel is pushed inside the rim before the Turntable is seated.

Fig. 12. Removing the Turntable.

REPLACING THE MOTOR

Early models used the 141-92 and 141-94 motors. The 141-92 motor is unmarked while the 141-94 motor has "GI" stamped underneath the lower bearing support bracket. These motors are interchangeable except for the spring drive bushings. The 141-92 motor uses a 80-452 bushing for 50 cycle operation and a 80-453 bushing for 60 cycles. The 141-94 motor uses a 80-543 bushing for 50 cycles and a 80-549 bushing for 60 cycles. Later releases use a 141-104 motor for 60 cycle operation, and 141-103 motor for 50 cycle use. These motors can be used to replace the early models.

When a replacement Motor is ordered, include the line voltage and frequency of the receiver.

To replace the Motor, unsolder the connecting leads, remove the Turntable, the three "C" washers and allow the Motor to drop out. Remove the spring bushing from the shaft of the defective Motor by turning it against the direction of wind and re-install on the new motor. When the new Motor is installed do not draw the connecting leads tight as this will prevent the Motor from "floating" on its spring mounts. Be certain that the "C" washers are crimped and the leads securely soldered and taped.

REPLACING THE CHAIN

To replace the Chain, loosen the adjustable idler (Screw "D" Fig. 13) and remove the Chain. Open a link, and pull the Chain out. Open a link in the replacement Chain and thread it in place. Be certain that the open ends of the links face outward from the Base Plate (see Fig. 13). (This will prevent the Chain from being installed in reverse.) Carefully close the link in the new Chain and be certain that there is no stiffness in its action. Read the paragraph on synchronization before the Chain is permanently installed.

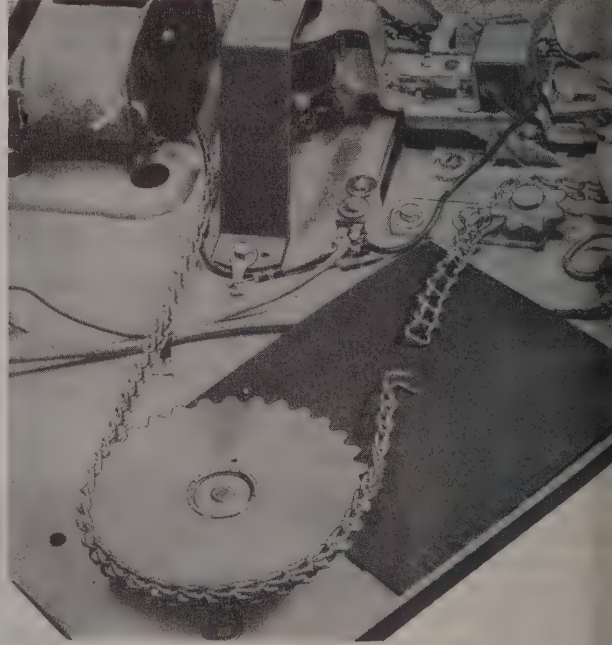


Fig. 13. Replacing the Chain.

TROUBLE SHOOTING

SQUEAKS OR NOISES DURING PLAYING OF RECORDS

a. Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.

b. Check lubrication.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT.

a. Check line voltage and frequency.
b. Check lubrication.
c. Motor windings damaged.
d. Room temperature abnormally low.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START RECORD CHANGE CYCLE.

a. See that the OFF-AUTO-MAN switch is set to AUTO.
b. Check Record Change Switch.
c. Check Cut-out Switch.
d. Check electrical continuity of solenoid circuit.
e. Check solenoid energizing voltage on motor.

MOTOR FAILS TO RUN EVEN WHEN IT IS ENTIRELY DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING.

a. Open windings.
b. Damaged or frozen bearings.
c. Lower Bearing Support Bracket bent. Remove and straighten bracket—Re-center armature.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

a. Changer not "floated" properly. Loosen mounting bolts.
b. Motor mounting Spring Clips rubbing on the idler wheel.
c. Motor leads pulled tight preventing motor from "floating" freely on its springs.
d. Pre-amp not floated.
e. Noisy 7F7 tube.
f. Impression on Idler Wheel.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES.

a. Cabinet tilted.
b. Badly worn or broken needle cartridge.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

a. Check Tone Arm height adjustment. (Adjustment 2.)

CHANGER CYCLES WITH OFF-AUTO-MAN SWITCH ON MAN.

a. Check AUTO-MAN-OFF switch.
b. Chain too tight.
c. Check Trigger Spring. (Fig. 4)

TONE ARM FALLS OFF RECORD.

a. Check Tone Arm set down adjustment. (Adjustment 1)
b. Check Tone Arm mounting screws.
c. Changer not level.

TONE ARM SET-DOWN POSITION VARIES.

a. Loose Tone Arm set down adjustment lock screw.
b. Loose Tone Arm mounting screw.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

a. See that the Phono Radio switch is on Phono.
b. Check receiver audio by listening to radio.
c. Check 7F7 tube.
d. Check Needle Cartridge.
e. Check Tone Arm Housing for broken leads.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

a. Check Tone Arm set down adjustment. (Adjustment 1.)

CHANGER CONTINUES TO CYCLE.

a. Check Cycling switch adjustment. (Adjustment 3.)
b. Check Record Change switch.
c. Clutch release mechanism sticks.
d. Tight drive chain.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

a. See that the OFF-AUTO-MAN switch is set to AUTO.
b. Be certain the record has an eccentric center groove.
c. Check Cycling switch.
d. Check Cut-out switch. (Normally closed.)
e. Check Clutch Release Arm for freedom of action.

SQUEAKS WHEN CHANGER IS IN CYCLE.

a. Friction between Lift Pin and Timing Sprocket. Apply a thin coat of Sta-Put.

FAILS TO EJECT RECORDS ACCOMPANIED BY A CLICKING SOUND.

a. Clutch slips. A slight upward bend of the Clutch Release Arm will correct this condition.

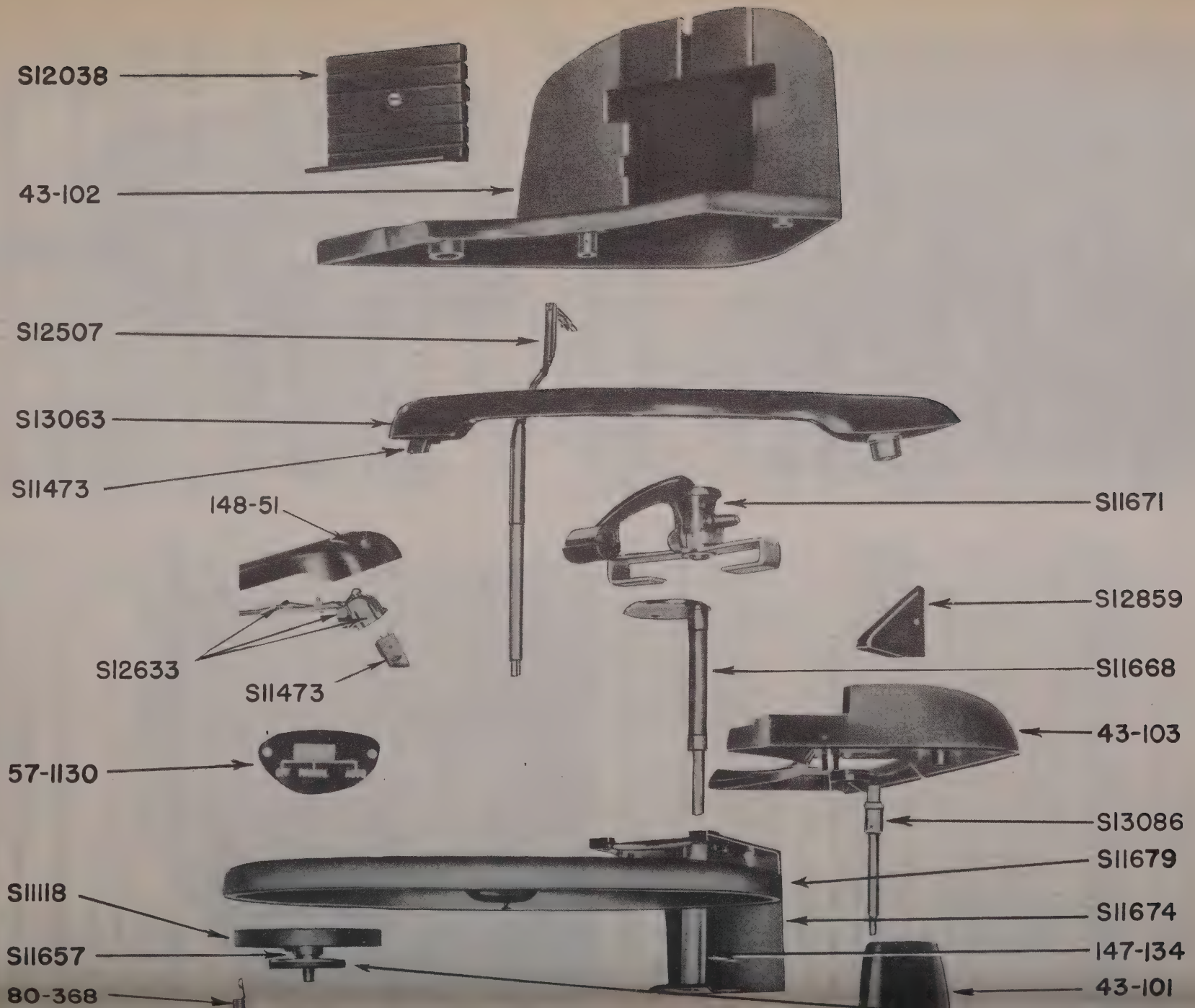
TONE ARM STICKS OR HANGS UP DURING CYCLE.

a. Clutch Release Arm pressure on Timing Sprocket too great. Loosen the solenoid bracket and insert a very thin shim between it and the base plate. If the condition still prevails, increase the thickness of the shim.

b. Burrs in synchronizing notch or Clutch Release Arm Tip. Remove with a file.

MOTOR RUNS BUT TURNTABLE SLIPS OR STOPS.

a. Turntable not fully seated. Tap gently.
b. Defective Idler Wheel.


S12038
43-102
S12507
S13063
S11473
148-51
S12633
S11473
57-1130
S11671
S12859
S11668
43-103
S13086
S11679
S11674
147-134
43-101
S11118
S11657
80-368

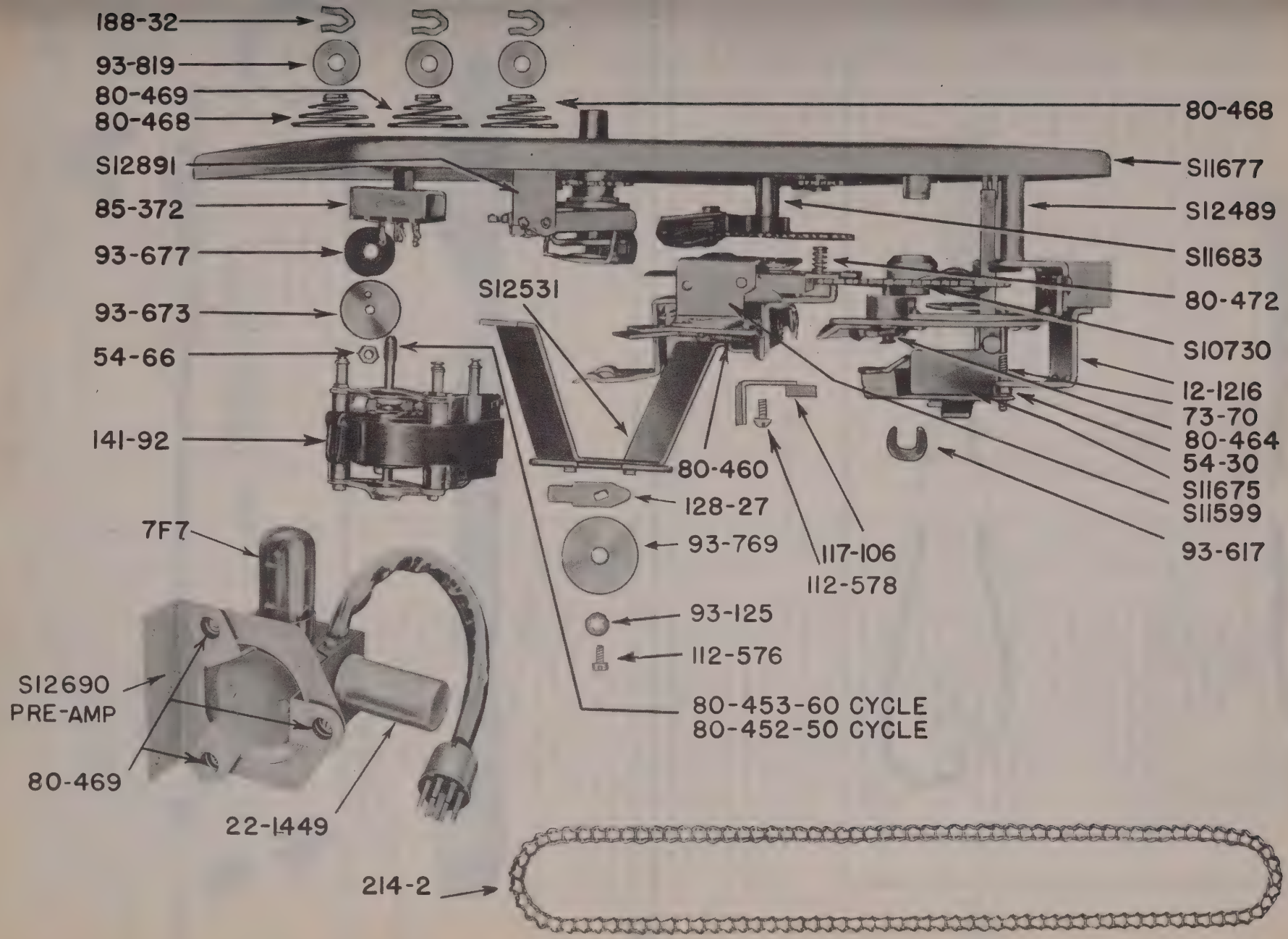


Fig. 14. Exploded View of Record Changer

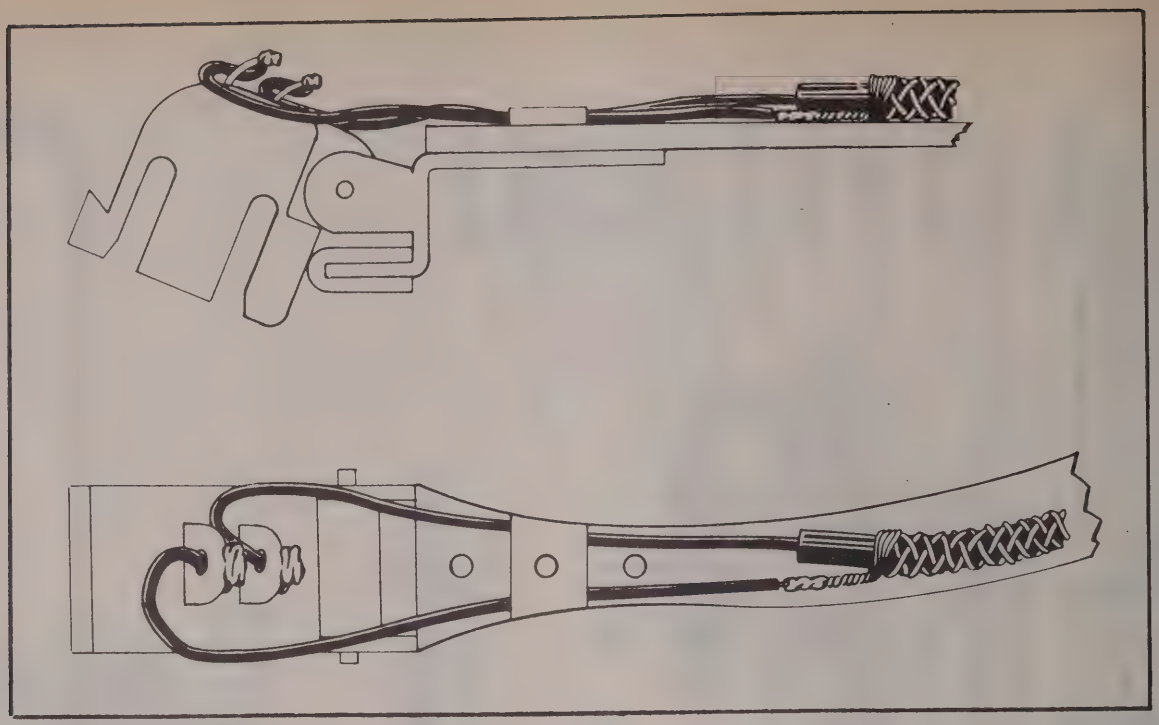


FIGURE 15

Fig. 15 shows how the leads are connected to the Needle Cartridge Socket. The lead and insulation are run through the hole in the contact and the lead is soldered with a light soldering iron. Great care must be exercised, and very little heat applied as the socket is made of lucite and will burn easily. The complete lead, socket and bracket are supplied as S-12633

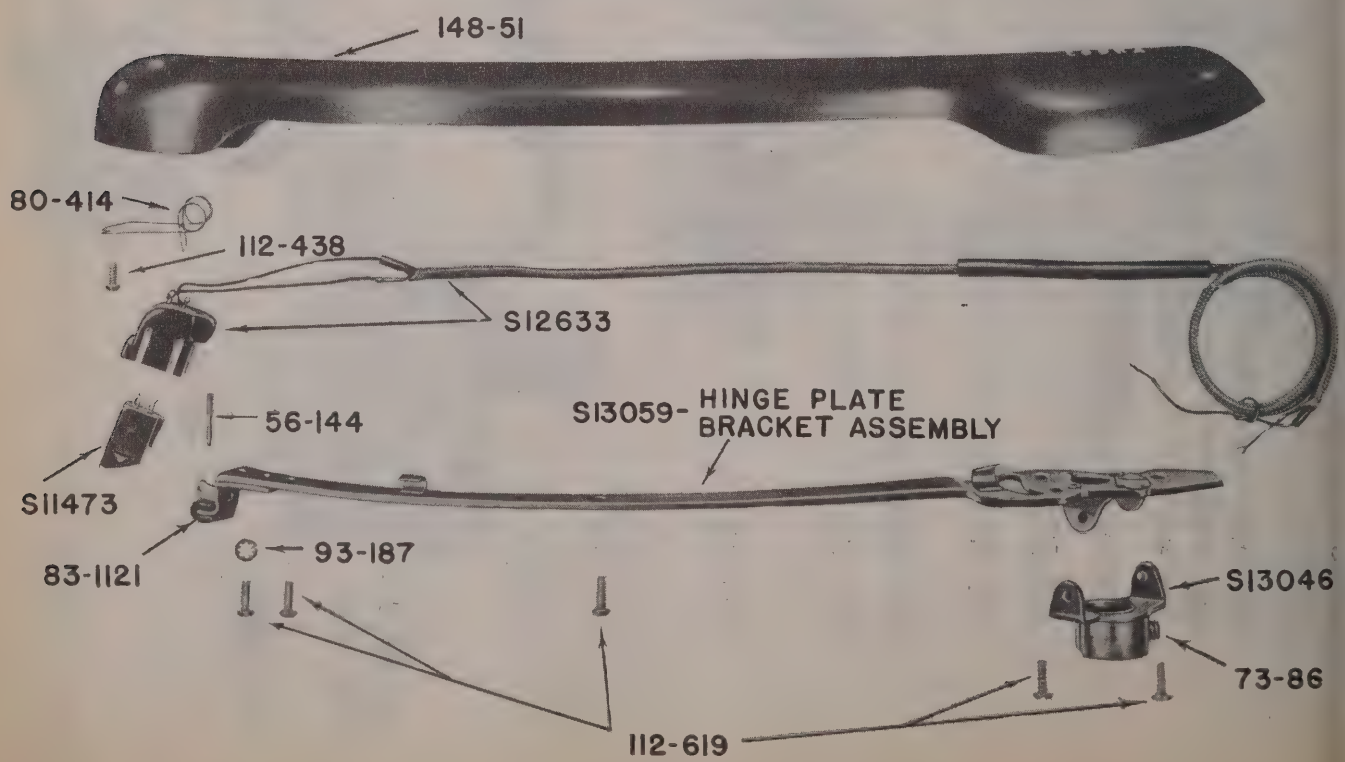


Fig. 16. Exploded View, Cobra Tone Arm.

NUMERICAL PARTS LIST

Part No.	Description
S-10730	Timing Sprocket Assembly
S-10732	Idler Assembly
S-11118	Idler Wheel Assembly
S-11458	Solenoid and Bracket Assembly
S-11473	Needle Cartridge
S-11580	Trip Contact and Support Strip Assembly
S-11599	Clutch Release Arm—Trip Plate and Bracket Assembly
S-11638	Pre-Amp Chassis Base Assembly
S-11640	Pre-Amp. Phono Unit Assembly
S-11657	Idler Wheel Stud and Washer Assembly
S-11668	Record Ejector Cam and Shaft Assembly
S-11671	Pressure Arm and Bracket Assembly
S-11674	Record Support Plate and Bracket Assembly
S-11675	Discriminator Lever and Bracket Assembly
S-11677	Base Plate, Sprocket and Drive Shaft Bearing Assembly
S-11683	Selector Sprocket and Bushing Assembly
S-12038	Record Ejector Housing Cover Assembly
S-12489	Tone Arm Pivot Shaft and Bracket Assembly
S-12493	Spring Contact and Insulator Assembly
S-12507	Record Spindle Assembly
S-12531	Bracket and Spring Assembly
S-12541	Contact Assembly
S-12542	Contact Assembly
S-12633	"Cobra" Socket and Cable Assembly
S-12859	Discriminator Knob and Plate Assembly
S-12891	Trip Contact and Bracket Assembly
S-13046	Swivel Bracket, Bushing and Pin Assembly
S-13063	Complete Cobra Tone Arm Assembly with Needle Cartridge
S-13086	Tone Arm Lift Pin Assembly
S-13371	Turntable and Record Locating Stud Assembly
12-1216	Tone Arm Pivot Bracket
12-1224	Pre-Amp Mounting Bracket
19-123	Phono Frame Mounting Clips
22-417	.1 Mfd. Paper Dielectric Capacitor
22-1449	30 Mfd. Electrolytic Capacitor
22-1570	.05 Mfd. Paper Dielectric Capacitor 400 v.
43-101	Tone Arm Support Housing (Casting)
43-102	Record Ejector Housing (Black Polystyrene)
43-103	Tone Arm Housing (Black Polystyrene)
54-30	8-32 x 5/16 x 7/64 Hex Nut—Steel N.P.
54-34	No. 6-32 x 1/4 Hex Nut—Steel N.P.
54-66	No. 10-32 x 5/16 Hex Nut—Steel N.P.
56-149	Phono Cartridge Socket Retaining Pin
56-167	Locating Bushing Pin
57-1117	Discriminator Trip Plate
57-1130	Switch Escutcheon
63-582	680 Ohm Carbon Resistor—1/4 W. ± 20%
63-589	10,000 Ohm Carbon Resistor—1/4 W.
63-604	10 Megohm Carbon Resistor—1/4 W.
69-36	8-32 x 1/4 R.H.M.S.—Steel N.P.
71-71	No. 6-32 x 1/4 Phillips Flat Head M.S.
73-59	8-32 x 5/16 Slotted Headless Set Screw
73-70	No. 8-32 x 1/2 Allen Head Set Screw
73-86	Cobra Tone Arm Mounting Screw
73-88	Set Screw for 94-582 Drive Bushing
80-138	Idler Wheel Retaining Spring
80-368	Idler Wheel Tension Spring
80-406	Trip Lever Pawl Spring
80-414	Needle Cartridge Socket Tension Spring
80-418	Pressure Arm Tension Spring
80-452	Spring (50 cycle Operation 141-92 Motor Shaft)
80-453	Spring (60 cycle Operation 141-92 or 105 Motor Shaft)
80-458	Trip Contact Spring
80-460	Trip Lever Tension Spring
80-462	Cam Spring
80-464	Pawl Spring
80-465	Contact Spring
80-466	Contact Spring
80-468	Motor Mounting Spring (2 End)
80-469	Motor Mounting Spring (Center)
80-472	Trip Lever Plate Actuating Spring
80-479	Spring (Spindle Dog)
80-510	Trip Contact Spring
80-531	Brake Spring
80-532	Contact Spring
80-538	Landing Adjustment Spring
80-543	Spring (60 cycle Operation)
80-543	Spring (50 cycle Operation 141-94 Motor Shaft)
80-549	Spring (60 cycle Operation 141-94 Motor Shaft)
83-341	Single Lug Terminal Strip
83-420	Three Lug Terminal Strip
83-1091	Insulating Strip
83-1107	Insulator Strip
83-1121	Phono Cartridge Socket Felt Bumper
83-1240	Record Changer Trim Strip
84-65	Tone Arm Rest
85-372	Slide Switch (3 Position)
86-81	Shakeproof Lug No. 2101-8
93-35	3/8 x .144 x .032 Flat Washer—N.P.
93-125	No. 6 Internal Shakeproof Lockwasher
93-126	No. 8 Internal Shakeproof Lockwasher
93-415	No. 6 External Shakeproof Lockwasher
93-582	5/16 x .129 x .025 Steel Washer—Cad. Pl.
93-617	Sprocket Shaft Retaining Washer
93-673	Idler Wheel Stud Washer—Small
93-677	Idler Wheel Stud Fishpaper Washer—Large
93-678	Idler Wheel Stud Fishpaper Washer—Small
93-679	Idler Wheel Stud Flat Washer—Large
93-719	7/16 x 3/16 x .031 Flat Washer—N.P.
93-754	No. 4 Internal Shakeproof Lockwasher
93-767	Cam Spacer Washer
93-769	7/8 x .140 x .043 Steel Washer Cad. Pl.
93-819	Motor Mounting Washers (3)
93-1121	Phono Cartridge Socket Felt Bumper
94-334	Mounting Bushing
94-415	Locating Bushing
94-505	Insulating Bushing (Cutout Contact)
94-582	Drive Bushing 141-103 Motor
97-213	Motor Mounting Stud
112-415	8-32 x 3/8 Flat Head Screw
112-420	Record Changer Mounting Bolts
112-438	Needle Cartridge Socket Tension Spring Mounting Screw
112-548	6-32 x 1/2 Recessed Stove Head M.S.
112-562	4-40 x 7/8 R.H. Stan-Tap Screw
112-576	5-40 x 1/4 Oval B.H.M.S. Steel N.P.
112-578	6-32 x 1/4 Oval B.H.M.S. Steel N.P.
112-579	8-32 x 3/8 R.H. Shakeproof Type Screw
112-581	6-20 x 3/8 R.H. Self Tapping Screw
112-619	Cobra Tone Arm Mounting Screws (5)
114-89	8-32 x 5/16 Hex Acorn Head M.S. Steel N.P.
114-180	No. 6 x 1/4 Hex Head Slotted Screw
114-199	6 x 3/16 Hex Head Slotted Screw
114-200	6-32 x 5/16 Hex Head Slotted Screw
114-201	8-32 x 5/16 Hex Head Slotted Screw
114-217	8-32 x 1/4 Hex Head Slotted Screw
114-248	6-20 x 5/16 Hex Head Slotted Screw
115-24	4-40 x 3/16 Fillister H.M.S.—Steel N.P.
117-106	Position Trip Lever
125-16	Gum Rubber Grommet
126-470	Pre-Amp Chassis Shield

Part No.	Description
128-27	Cam
141-92, or 94	50/60 cycle Phono Motor
141-103	50 cycle Phono Motor (Replaces 141-92, 94 Motors 50 cycle Operation)
141-105	60 cycle Phono Motor (Replaces 141-92, 94 Motors 60 cycle Operation)

Part No.	Description
147-134	Cylindrical Spacer (Drive Shaft Bracket)
148-51	Tone Arm Housing
166-30	Pressure Arm Rubber Bumper
188-27	Record Spindle Retaining Washer
188-32	Motor Mounting Retaining Rings (3)
214-2	Sprocket Drive Chain

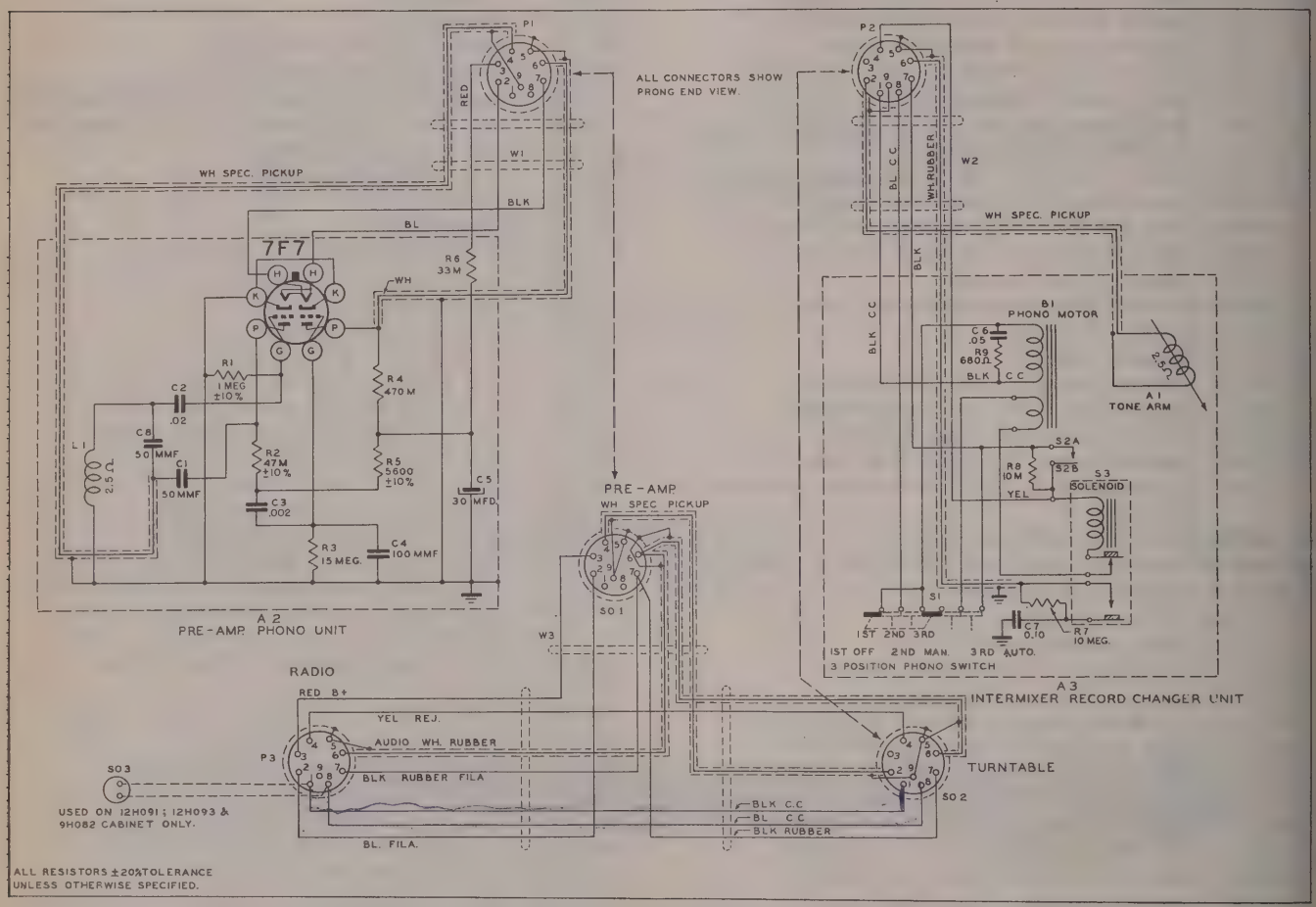


Fig. 17. Schematic Diagram of Record Changer and Pre-Amp.

Diag. No.	Part No.	Description	
C1	22-1532	50 MMF.	500V.
C2	22-327	.02 MFD.	200V.
C3	22-1220	.002 MFD.	600V.
C4	22-162	100 MMF.	600V.
C5	22-1449	30 MFD. Electro.	300V.
C6	22-1570	.05 MFD.	400V.
C7	22-417	0.10 MFD.	600V.
C8	22-367	50 MMF.	500V.
R1	63-441	1 MEGOHM	¼ W.
R2	63-648	47 MOHM	¼ W.
R3	63-976	15 MEGOHM	¼ W.
R4	63-597	470 MOHM	¼ W.
R5	63-638	5600 OHM	¼ W.
R6	63-592	33 MOHM	¼ W.
R7	63-604	10 MEGOHM	¼ W.

Diag. No.	Part No.	Description	
R8	63-589	10 M OHM	¼ W.
R9	63-582	680 OHM	¼ W.
A1	S13063	Tone Arm Complete	
A2	S11640	Pre-Amp. Phono Unit	
A3	S11680	Intermixer Record Changer Unit 60~	
A3	S13300	Changer Unit 25~	
B1	141-105	Phono Motor 60~	
B1	141-99	Phono Motor 25~	
L1	S12603	42.5 Micro Henry	
P1, P2, P3	58-133	Phono Plug	
SO1	78-582	Phono Socket	
SO2	78-582	Phono Socket	

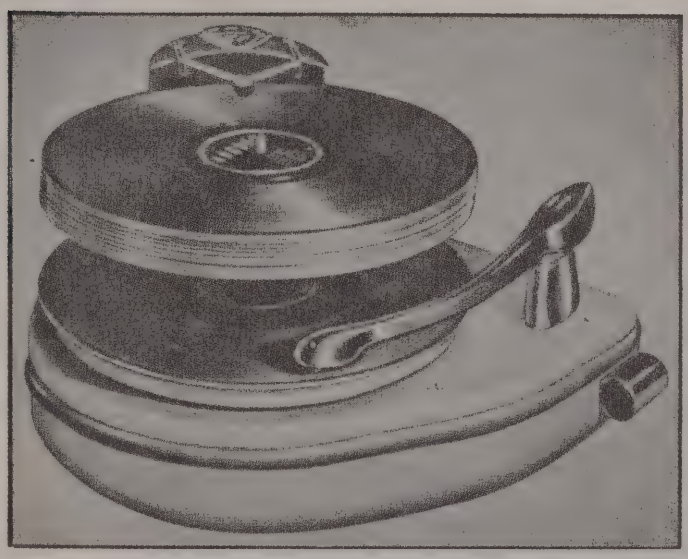
Diag.No.	Part No.	Description
SO3	52-188	2 Prong Receptacle
S1	85-372	3 Pos. Switch
S2A	S12891	Trip Contact Assembly
S2B	S12579	Insulator Strip "
S3	S11458	Solenoid Mag. "
W1	S12601	Cable Assembly
W2	S12602	Cable Assembly
W3	S12604	Cable—Used on Models 12H090; 12H092; 12H094; 9H088
W3	S12605	Cable—Used on Models 12H091; 12H093
W3	S12606	Cable—Used on Models 9H081; 9H079
W3	S12607	Cable—Used on Model 9H082

Printed in U.S.A.
10 M 7-1-47

SERVICE MANUAL

MODEL S-14001

AUTOMATIC RECORD CHANGER



ZENITH RADIO CORPORATION

CHICAGO 39, ILLINOIS, U. S. A.

TO THE SERVICE MAN:

This Service Manual has been prepared for the purpose of assisting the Service Man in his work of caring for the Record Changer mechanism, whether he is called to remedy some difficulty, or to insure the continued satisfactory operation. The Zenith Automatic Record Changers are constructed with a minimum of working parts, and in operation are simple and reliable. However, as is the case with all mechanical units, misalignment and trouble may occasionally develop. The information presented in this book will enable the Service Man to render quick and accurate service. For convenience, the Operating Instructions supplied with each Record Changer are summarized as follows:

The Record Changer will automatically play up to twelve 10 inch or ten 12 inch records at one loading. The Record Stack rests on the Spindle and the Record Shelf. The Selector Sprocket drives the Ejector Plate which pushes the records off the Shelf and Spindle allowing them to drop on the Turntable. To load for automatic operation, set the Record Size Selector Knob to 10 or 12, raise the Pressure Bar, place the stack of records on the Spindle, lower the Pressure Bar until it rests on the Record Stack. Set the AUTO-MAN-OFF switch to AUTO and press the Record Change Button. The Changer will play the entire selection of records and will repeat the last record until it is turned off. For manual operation set the AUTO-MAN-OFF switch to MAN and play the records singly as on a non-automatic record player.

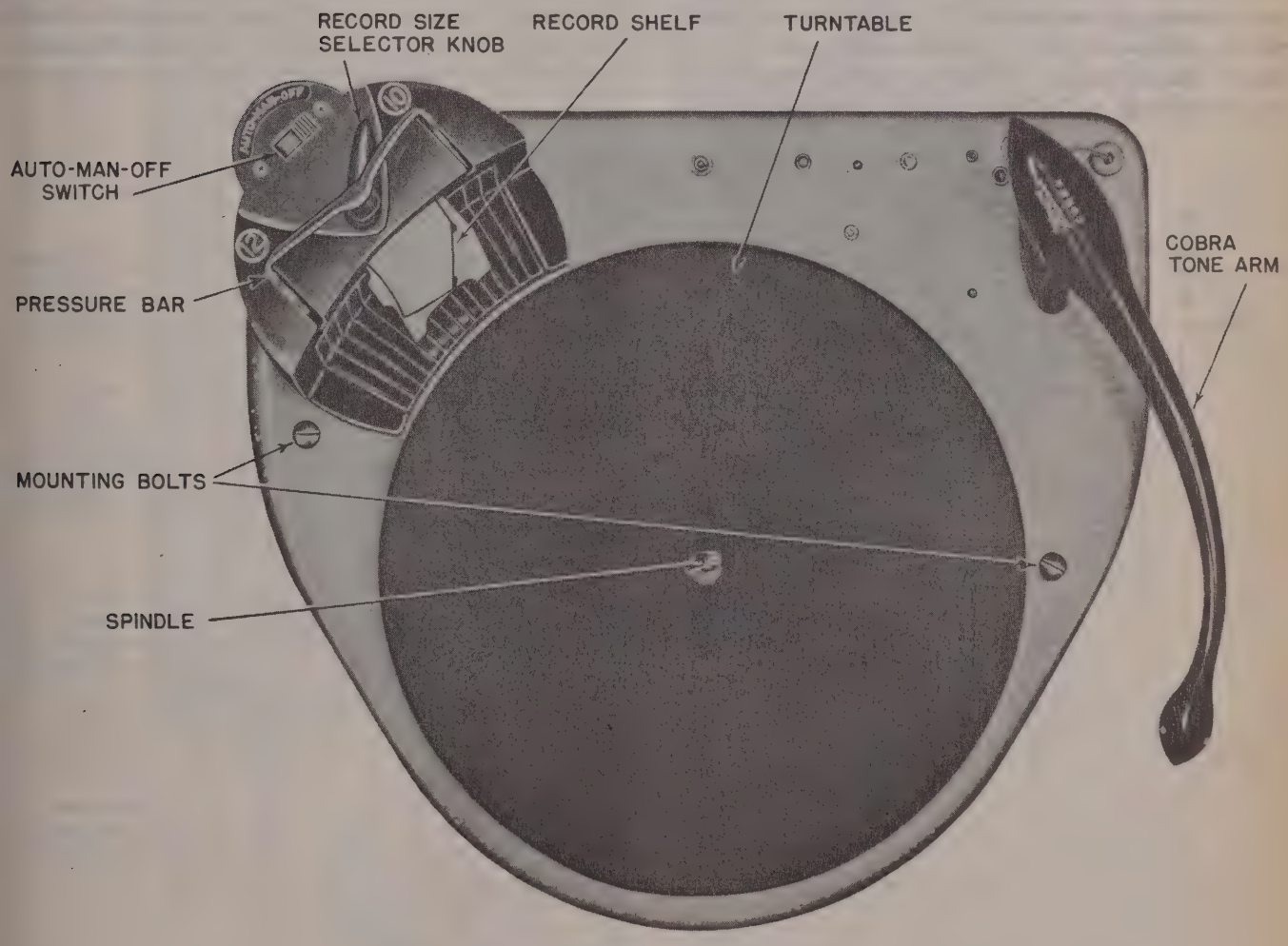


Fig. 1. Top View of Record Changer.

DESCRIPTION OF CYCLING

The phono motor friction drives the idler wheel. The idler wheel rim drives the turntable, and the turntable shaft. To the turntable shaft is attached the segmented clutch drive plate. The pawl on the clutch drive sprocket assembly engages the drive plate causing the sprocket to rotate. The pawl pusher lever on the clutch release arm assembly causes the clutch to engage or disengage.

Closing either the trip switch or the record change switch energizes the solenoid. The magnetic flux of the solenoid attracts the clutch release lever causing the mechanism to trip and move the pawl pusher arm away from the clutch pawl. This action allows the clutch pawl spring to pull the pawl into position for the drive plate segment to engage and start the clutch sprocket rotating. The clutch sprocket is meshed with the chain drive sprocket and the chain drives the selector and timing sprockets.

The timing sprocket completes 7 functions through 360° rotation. These functions are as follows: 1. Applies the tone arm brake. The brake lever is actuated by the brake stud on the timing sprocket. The brake prevents coasting and erratic landing of the needle. 2. The inclined groove pushes the lift pin upward. The lift pin raises and lowers the tone arm. 3. The locating pin laterally swings the tone arm off the record stack. 4. The locating pin or bushing swings the tone arm over the starting groove of the record. With 12″ records, the locating pin swings the tone arm in while the locating bushing swings the tone arm with 10″ records. The locating bushing is pushed upward by the record selector lever. 5. The reset stud resets the clutch trip mechanism. Moves the pawl pusher arm in the path of the clutch pawl. 6. The lift pin lowers the tone arm over the starting groove of the record. 7. The brake stud releases the brake. When the clutch pawl hits the pawl pusher arm, the clutch selector disengages.

The selector sprocket actuates the record ejector plate and must be timed with the timing sprocket to drop the records on the turntable when the tone arm is at its greatest outward swing. This occurs immediately after the No. 3 function of the timing sprocket.

As the record is played, the tone arm gradually moves toward the center. The ratchet on the tone arm control lever moves toward pawl on the trip switch lever. As the ratchet comes in contact with the pawl, the oscillating action produced by the eccentric groove on the record causes the trip switch to close, complete the solenoid circuit and repeat the cycle. If the record does not have an eccentric groove, the position trip will close the trip switch and start the next cycle.

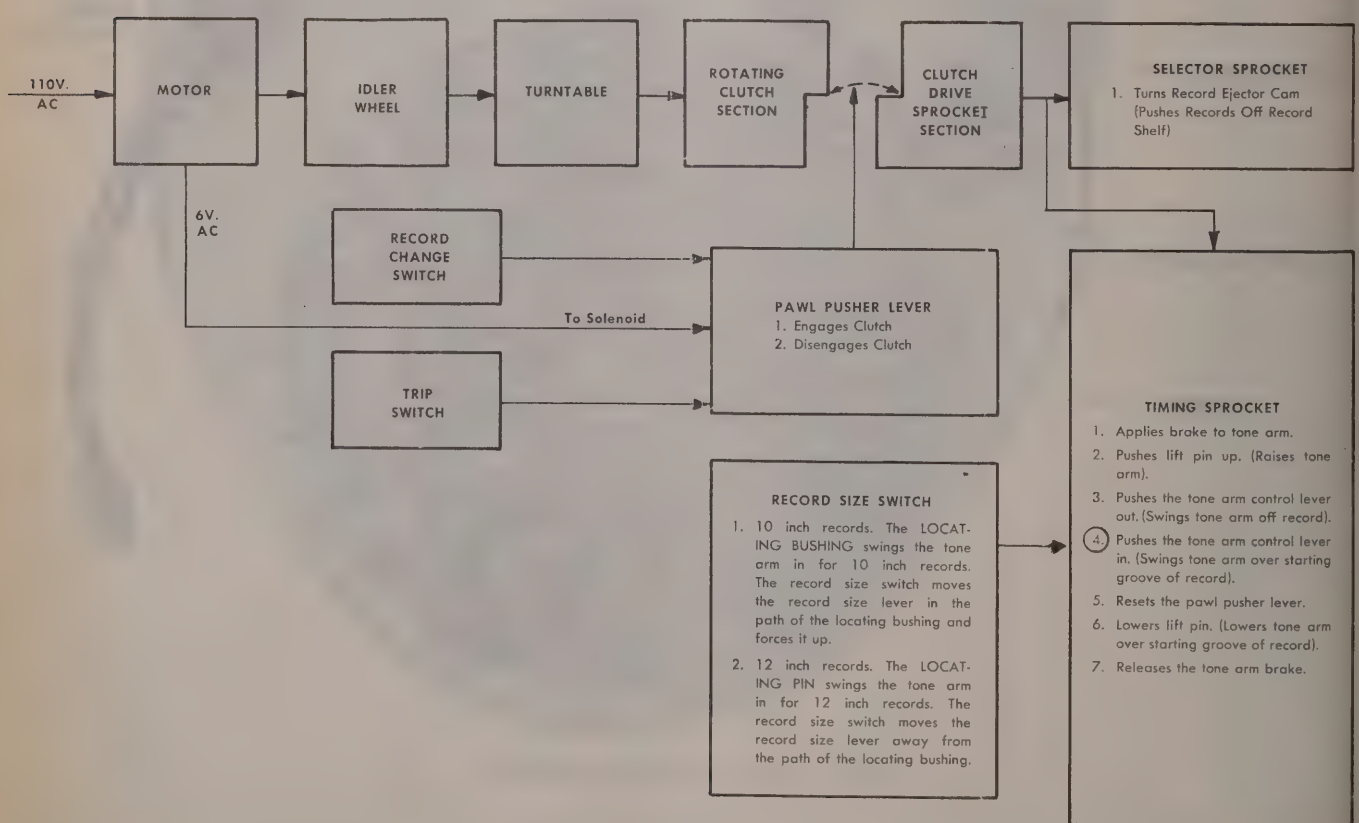

110V. AC
MOTOR
IDLER WHEEL
TURNTABLE
ROTATING CLUTCH SECTION
CLUTCH DRIVE SPROCKET SECTION
SELECTOR SPROCKET
1. Turns Record Ejector Cam (Pushes Records Off Record Shelf)
6V. AC
RECORD CHANGE SWITCH
To Solenoid
TRIP SWITCH
PAWL PUSHER LEVER
1. Engages Clutch
2. Disengages Clutch
TIMING SPROCKET
1. Applies brake to tone arm.
2. Pushes lift pin up. (Raises tone arm).
3. Pushes the tone arm control lever out. (Swings tone arm off record).
4. Pushes the tone arm control lever in. (Swings tone arm over starting groove of record).
5. Resets the pawl pusher lever.
6. Lowers lift pin. (Lowers tone arm over starting groove of record).
7. Releases the tone arm brake.
RECORD SIZE SWITCH
1. 10 inch records. The LOCATING BUSHING swings the tone arm in for 10 inch records. The record size switch moves the record size lever in the path of the locating bushing and forces it up.
2. 12 inch records. The LOCATING PIN swings the tone arm in for 12 inch records. The record size switch moves the record size lever away from the path of the locating bushing.

Fig. 2. Sequence of Operation—Zenith Record Changers.

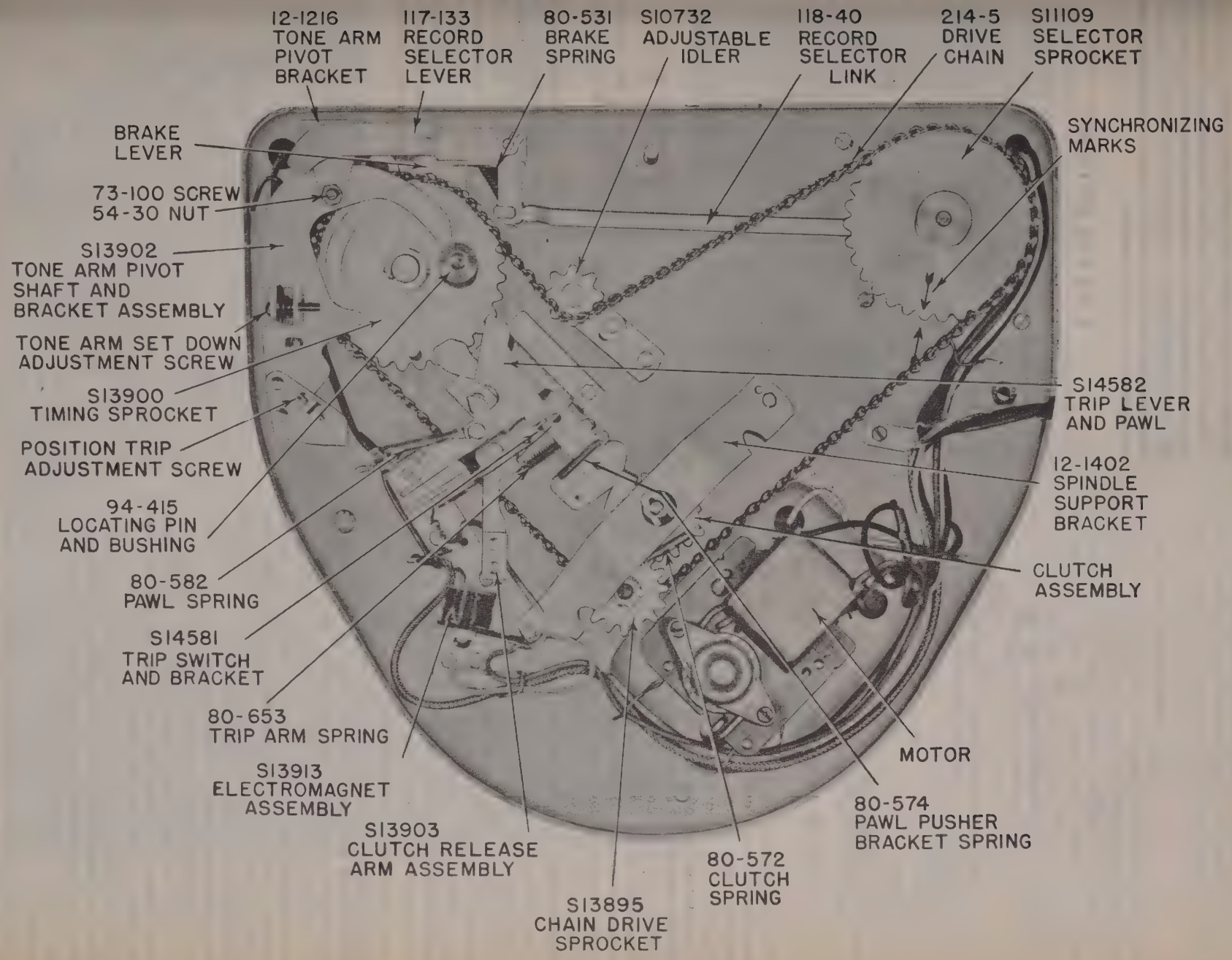


Fig. 3. Bottom View of Record Changer.

THEORY OF THE COBRA RADIONIC PICKUP

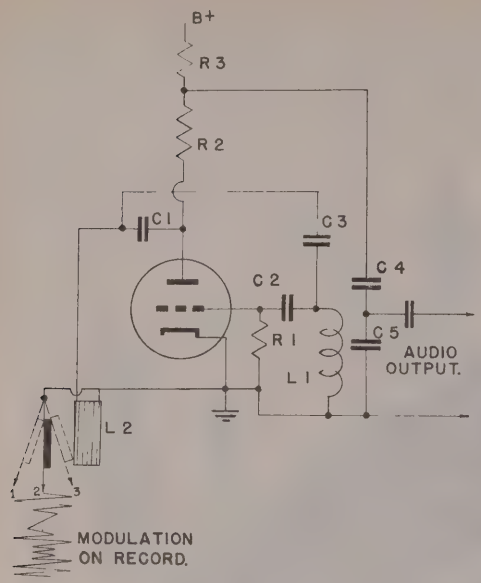


Fig. 4. Simplified Circuit of Oscillator.

The operation of the Cobra pickup is considerably different from Crystal and Dynamic pickups. These pickups generate audio power, while the Cobra controls power generated by a radio frequency oscillator. The triode tube is a modulated oscillator, detector and audio amplifier. The oscillator operates at a frequency of 2.5 Mc. Modulation is accomplished by changing the energy losses in a tuned circuit. These losses may be represented by an equivalent resistance in series with the reactance of the coil. The ratio of the resistance to the reactance determines the efficiency or Q of the coil. The amplitude of the RF voltage developed across this coil by the oscillator will vary with changes in Q.

The grid coil L_1 and other components of the oscillator are mounted in the receiver chassis, while the plate coil L_2 is in the Needle Cartridge with the vane and needle assembly. The coil is fixed and has 40 turns of No. 40 wire (approximate DC resistance 2½ ohms). The stainless steel vane, which is in the field of the coil, is spot welded to the osmium-iridium tipped stylus.

Any movement of the stylus will cause a corresponding movement of the vane. As the stylus and vane follow the modulations in the record, changes in the mutual inductance between the vane and coil occur (see Fig. 4). In position 2 the vane is at rest; and a constant RF voltage appears across the plate coil. As the vane is set in motion and reaches position 1, it is at its greatest outward swing from the coil, resulting in low mutual inductance, low reflected resistance, higher Q, and a higher RF voltage across the coil. In position 3 it is at its greatest inward swing; resulting in a high mutual inductance, high reflected resistance, lower Q and a lower RF voltage. It can be seen that the amplitude of the RF voltage which appears across the coil will vary with changes in Q, satisfying the condition for amplitude modulation. The position of the vane changes both the Q and L of the coil. Changes in L shift the frequency slightly, and a certain amount of frequency modulation is present, but since there is no frequency discrimination it remains undetected.

Since the grid and plate coils are part of a single tuned circuit, any variations of amplitude of the RF voltage brought about by the changes in Q across the plate coil will also appear across the grid Coil L_1 causing a shift in the average plate current through the plate load resistor across which the audio output voltage is developed. Plate bend detection takes place since only the positive half of the grid swing causes an increase in the average plate current. These changes in the average plate current appear as audio voltage across the plate load resistor.

The 2.5 Mc. RF voltage and the audio voltage both appear at the plate of the oscillator triode. R_2, C_4 and C_5 filter out the RF voltage allowing only the audio component to the grid of the phono amplifier where it is amplified and reproduced by the loud-speaker.

LUBRICATION

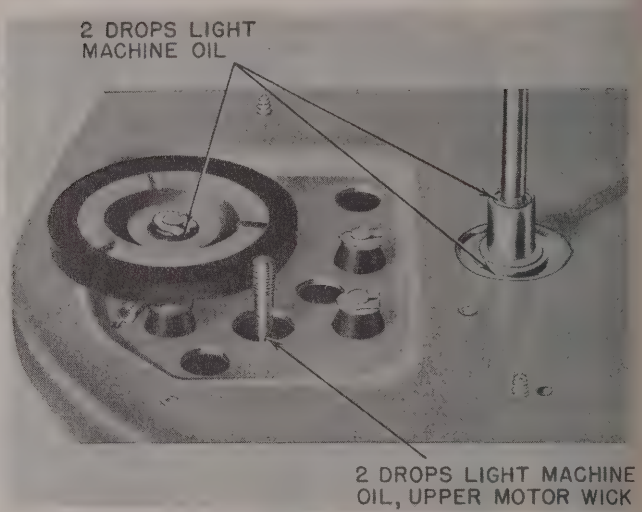


Fig. 5. Lubrication Top of Record Changer.

Sta-Put grease No. 512 (light grease of the vaseline type) and light machine oil of No. 10 consistency are used for lubrication throughout.

Figures 5 and 6 indicate the points to be lubricated and the type of lubricant to use. The Motor has two oil wicks which should be saturated with oil. The Record Spindle Guide Bearing, Idler Wheel Bearing, Lower Drive Shaft Bearing, Drive Shaft Thrust Bearing and the Motor Bearings are of the OILITE type and require very little attention. If squeaks develop, be certain that they are not caused by friction between the Spindle and records on the Turntable. A thin coat of wax on the Spindle will remedy this condition.

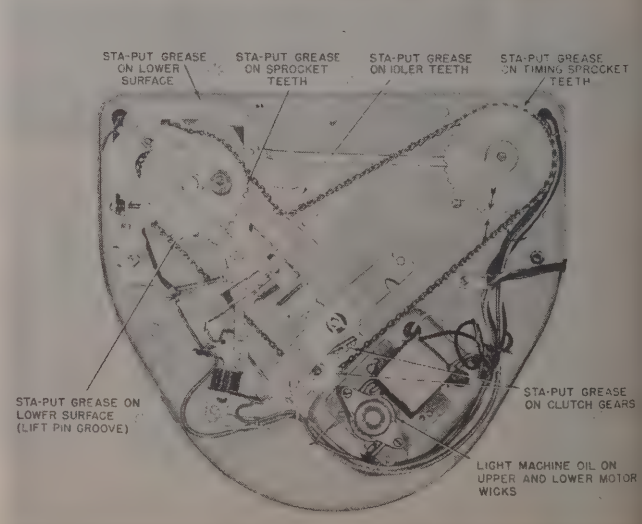

STA-PUT GREASE ON LOWER SURFACE
STA-PUT GREASE ON SPROCKET TEETH
STA-PUT GREASE ON IDLER TEETH
STA-PUT GREASE ON TIMING SPROCKET TEETH
STA-PUT GREASE ON LOWER SURFACE (LIFT PIN GROOVE)
STA-PUT GREASE ON CLUTCH GEARS
LIGHT MACHINE OIL ON UPPER AND LOWER MOTOR WICKS

Fig. 6. Lubrication Bottom of Record Changer.

1. Tone Arm Set Down Adjustment.

The Tone Arm Set Down Adjustment determines the landing position of the needle on the starting groove of the record. The adjustment screw can be reached with a screwdriver (Fig. 7). The tone arm must be held in the rest position while the adjustment is made. Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

2. Position Trip Adjustment.

The Position Trip does not depend on an eccentric groove in the record to start the record change cycle, but will trip the mechanism whenever the needle comes within a pre-determined distance from the Spindle. Older type records that do not have an eccentric groove can in most cases be played automatically by the proper adjustment of the Position Trip. Under normal conditions with the needle approximately 1⅞" from the center of the Spindle, adjust the Position Trip Adjustment Screw (Fig. 7) until the trip switch contacts close. This distance is generally satisfactory since no modern record will be cut off before it has completed its play, and none will fail to trip the mechanism at the end. In special cases, screw the Position Trip Adjustment Screw clockwise for earlier tripping and counter-clockwise for later tripping as the individual case may be.

It may be impossible to find an adjustment that will always trip the mechanism and never cut off on all type records, and in these special cases the record must be played manually.

3. Trip Switch Adjustment.

As the record is played, the ratchet on the tone arm pivot shaft engages the trip pawl. The oscillating action developed by the eccentric groove on the record closes the trip switch contacts and allows the solenoid to become energized. The magnetic flux attracts the trip lever which moves the pawl pusher lever from the path of the clutch pawl. This allows the clutch to engage and start the next cycle.

The gap between the trip switch contacts should be approximately 1/16 inch. If the spacing is incorrect, bend the contact spring. To adjust the contact spring tension, insert a screwdriver between the contact and guide springs and bend the contact spring so that an approximate pressure of one ounce is necessary to move the contact spring from the guide spring. Be certain that the contact spring exerts some pressure on the guide spring after adjustment.

The spacing between the trip magnet solenoid and trip lever should be approximately 3/32". (See Fig. 7.)

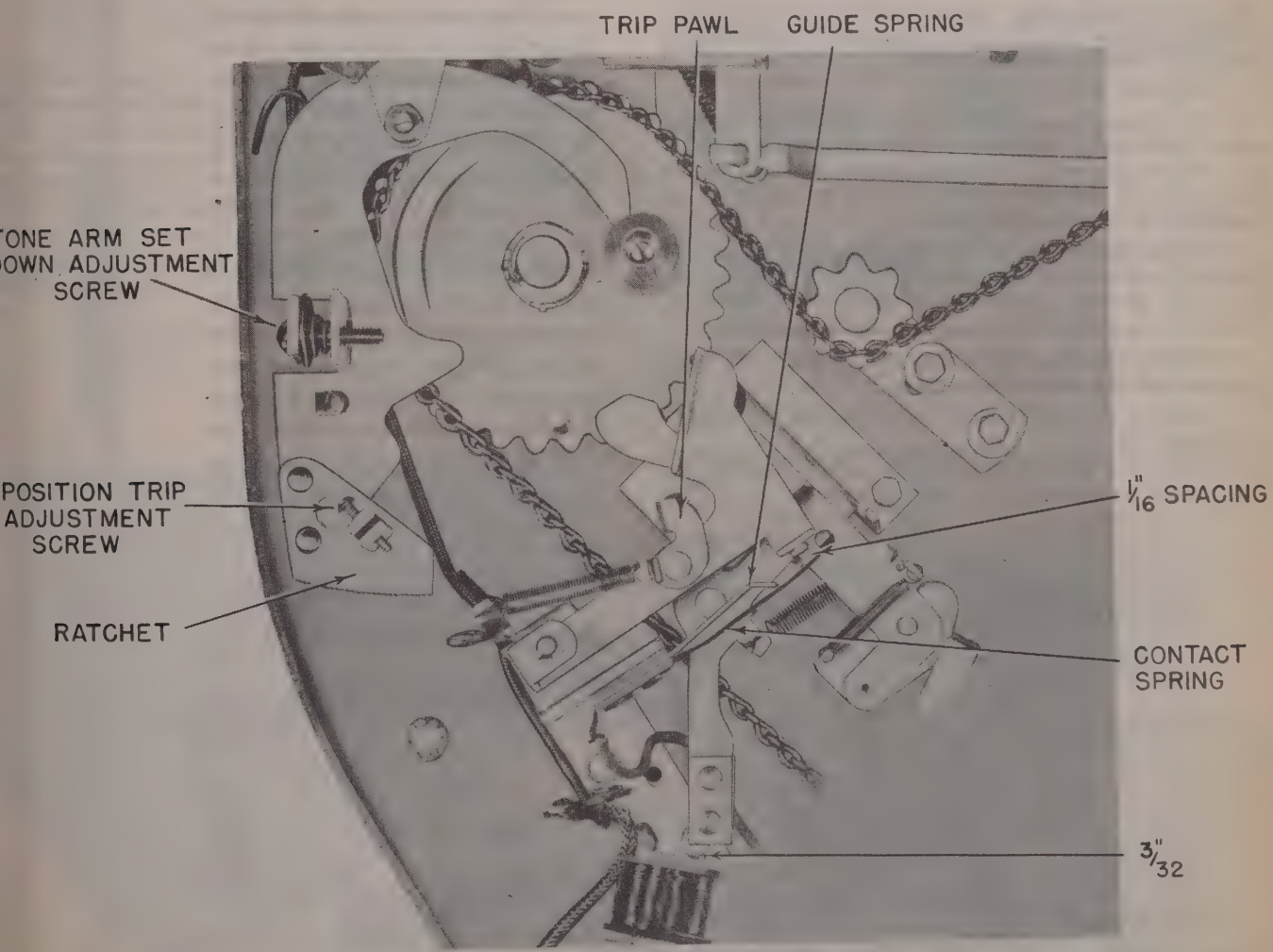


Fig. 7. Tone Arm Set Down, Position Trip and Trip Switch Adjustments.

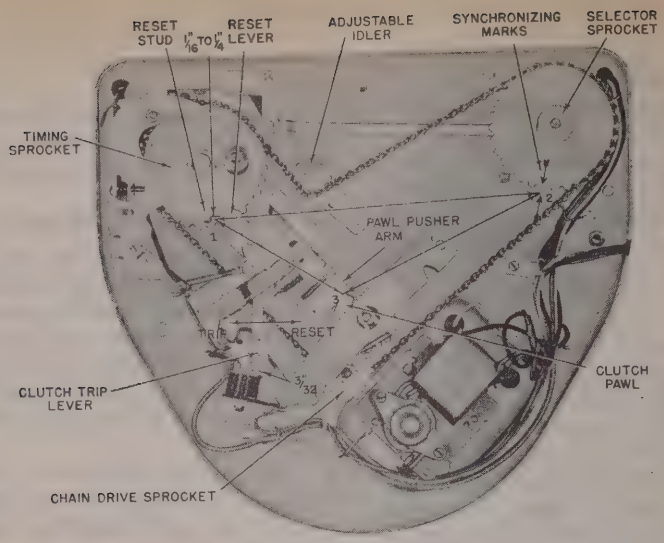


Fig. 8. Synchronization.

4. Synchronization.

A properly timed changer drops records on the turntable when the tone arm is at its greatest outward swing. Improper timing results in the records hitting the tone arm. The record changer is kept in time by the drive chain. If the chain is removed, the changer must be synchronized.

Fig. 8 indicates the correct position of the timing sprocket, selector sprocket and the clutch. To synchronize, study Fig. 8 and proceed as follows:

1. Reset the clutch trip lever.

2. Turn the timing sprocket until the reset stud is approximately 1/16" from the reset lever (1). Turn the selector sprocket until the synchronizing mark lines up with the mark on the base plate (2). THESE POSITIONS MUST BE MAINTAINED DURING THE NEXT OPERATION.

3. Thread the chain over the timing sprocket, chain drive sprocket, adjustable idler, selector sprocket and set the adjustable idler for medium tension of the chain. Check the position of the synchronizing marks and the reset stud.

4. Remove the retaining washer and lift the chain drive sprocket until the gears disengage.

5. Turn the clutch until the clutch pawl touches the pawl pusher arm (3).

6. Lower the chain drive sprocket until it engages the clutch gears and reinsert the retaining washer.

5. Tone Arm Height Adjustment.

The Tone Arm vertical rise is governed by the Lift Pin. The Lift Pin is adjustable (see Fig. 9). Too long a Lift Pin will cause the Tone Arm to hit the underside of the records on the Spindle. If the Lift Pin is short the needle will not clear twelve records on the Turntable. To make the proper adjustment, trip the Clutch by hand and rotate the Turntable clockwise until the Tone Arm starts to swing toward the Spindle. Gently push the Tone Arm as close to the Spindle as it will go, place a record over the Spindle and observe the spacing between it and the Tone Arm. The spacing "A" (Fig. 10), should be approximately the thickness of a record. If the spacing is incorrect, lift the Tone Arm, remove the Lift Pin, and adjust the Lift Pin to the proper length.

Fig. 9. Lift Pin.

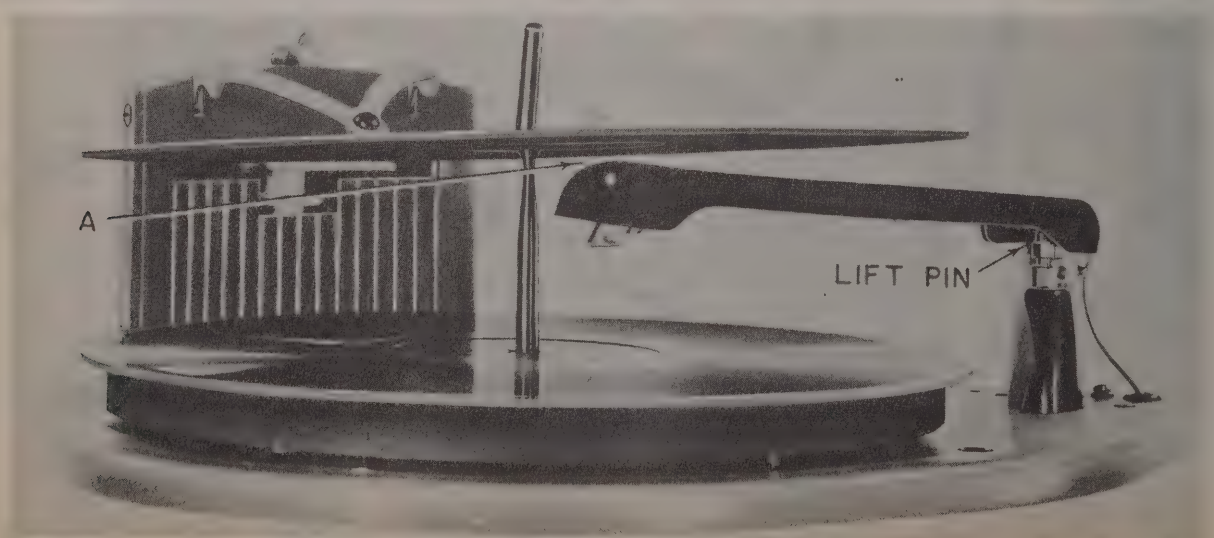


Fig. 10. Tone Arm Height Adjustment.

REMOVING THE TURNTABLE

Hold the clutch by inserting a wide blade screwdriver against the spindle bracket and a segment of the drive plate. Apply a twisting, pulling force to the turntable.

Before seating the turntable, be certain that the idler wheel is pushed inside the turntable rim.

Fig. 11. Removing the Turntable.

REPLACING THE MOTOR

When a replacement Motor is ordered, be certain that the line voltage and frequency of the receiver are given.

To replace the Motor, unsolder the connecting leads, remove the Turntable, the three retaining washers and allow the Motor to drop out. When the Motor is installed do not draw the connecting leads tight as this will prevent the Motor from "floating" on its mounts. Be certain that the retaining washers are crimped and the leads securely soldered and taped.

REPLACING THE CHAIN

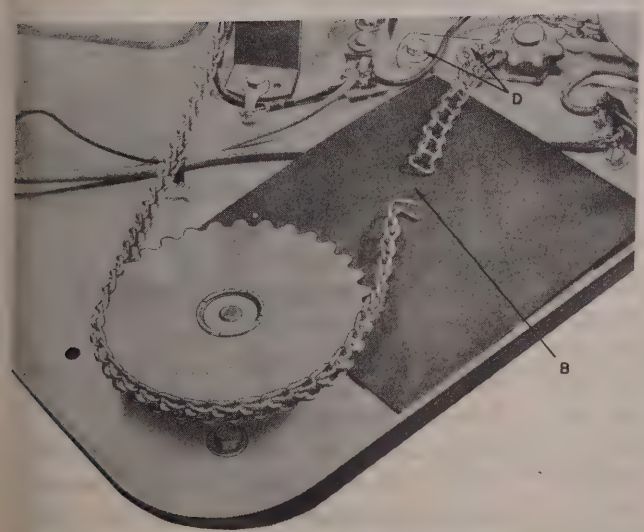


Fig. 12. Replacing the Chain.

The chain may be removed by loosening the adjustable idler (Screws "D", Fig. 12), and opening one of the links (B) It will be noted that on some models the open ends of the links face inward while on others outward as in Fig. 12. The reason for this is to get the quietest operation. Normally the open ends of the links will face outward with all replacement chains.

After the chain is threaded in place, carefully close the open link and be certain that there is no stiffness in its action. Read the paragraph on Synchronization before the chain is permanently installed.

TROUBLE SHOOTING

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

a. Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.

b. Check lubrication.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT.

a. Check line voltage and frequency.
b. Check lubrication.
c. Motor windings damaged.
d. Room temperature abnormally low.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START RECORD CHANGE CYCLE.

a. See that the AUTO-MAN-OFF switch is set to AUTO.
b. Check Record Change Switch.
c. Check electrical continuity of solenoid circuit.
d. Check the solenoid energizing voltage.

MOTOR FAILS TO RUN EVEN WHEN IT IS DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING.

a. Open windings.

b. Damaged or frozen bearings.

c. Lower Bearing Support Bracket bent. Remove and straighten bracket—Re-center armature.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

a. Changer not "floated" properly. Remove packing strip. Loosen mounting bolts.

b. Motor retaining rings rubbing on the idler wheel.

c. Motor leads pulled too tight preventing motor from "floating" freely.

d. Noisy phono oscillator tube.

e. Impression on Idler Wheel.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES.

a. Cabinet tilted.

b. Badly worn or broken needle cartridge.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

a. Check Tone Arm height adjustment. (Adjustment 5.)

CHANGER CYCLES WITH AUTO-MAN-OFF SWITCH ON MAN.

a. Check AUTO-MAN-OFF switch.

b. Reset stud does not engage clutch reset lever.

TONE ARM FALLS OFF RECORD.

a. Check Tone Arm set down adjustment. (Adjustment 1.)
b. Check Tone Arm Pivot Bracket.
c. Changer not level.

TONE ARM SET-DOWN POSITION VARIES.

a. Check Tone Arm Brake and Spring.
b. Loose Tone Arm mounting screw.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

a. See that the Phono Radio switch is on Phono.
b. Check receiver audio by listening to radio.
c. Check the phono oscillator tube.
d. Check Needle Cartridge.
e. Check Tone Arm Housing for broken leads.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

a. Check Tone Arm set down adjustment. (Adjustment 1.)

CHANGER CONTINUES TO CYCLE.

a. Check the trip switch adjustment. (Adjustment 3.)
b. Check Record Change switch.
c. Clutch release mechanism sticks.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

a. See that the AUTO-MAN-OFF switch is set to AUTO.
b. Be certain that the record has an eccentric center groove.
c. Check the Trip Switch.
d. Check the solenoid energizing voltage.

SQUEAKS WHEN CHANGER IS IN CYCLE.

a. Friction between Lift Pin and Timing Sprocket. Apply a thin coat of Sta-Put.

MOTOR RUNS BUT TURNTABLE SLIPS OR STOPS.

a. Turntable not fully seated. Tap gently.

NUMERICAL PARTS LIST

S-10732	Idler Assembly
S-11105	Record Ejector Plate and Pin Assembly
S-11106	Record Support Plate—Shaft and Pin Assembly
S-11107	Record Support and Ejector Bracket Assembly
S-11109	Selector Sprocket and Bushing Assembly
S-11111	Turntable Shaft and Bearing Assembly
S-11118	Idler Wheel Assembly
S-11441	Record Change Lever and Stud Assembly
S-11473	Cobra Needle Cartridge
S-11657	Idler Stud and Washer Assembly
S-12633	Needle Cartridge Socket and Cable Assembly
S-13060	Cobra Tone Arm Hinge Plate and Swivel Bracket Assembly
S-13062	Cobra Tone Arm Hinge Plate, Swivel Bracket, Needle Cartridge Socket and Cable Assembly
S-13466	Cobra Tone Arm Assembly
S-13894	Clutch Pawl Assembly
S-13895	Drive Sprocket and Bushing Assembly
S-13896	Turntable Drive Shaft Bearing Assembly
S-13900	Timing Sprocket Assembly
S-13901	Trip Switch Assembly
S-13902	Tone Arm Pivot Shaft and Bracket Assembly
S-13903	Clutch Release Arm Assembly
S-13913	Magnet Coil Assembly
S-13931	Turntable Assembly
S-13933	Main Base Plate Assembly
S-14140	Record Spindle Assembly
S-14172	Cable Assembly
S-14581	Trip Lever Mounting Bracket Assembly
S-14582	Trip Lever and Pawl Assembly
12-1216	Tone Arm Pivot Bracket
12-1390	Magnet Mounting Bracket
12-1402	Record Spindle Support Bracket
17-81	Cable Clamp
23-22	AC Wire Connector
24-445	Record Ejector Housing Cover
43-152	Record Ejector Housing
43-157	Tone Arm Support Housing
46-695	Record Selector Knob
54-30	No. 8-32 x 5/16" Hex Nut—Steel N.P.
54-66	No. 10-32 x 5/16" x 1/8" Hex Nut—Steel N.P.
56-128	Groove Pin (Sprocket Bushing)
56-226	Tone Arm Lift Pin—Lower
56-227	Tone Arm Lift Pin—Upper
57-1323	Turntable Shaft Plate
58-158	Five Prong Plug (for S-14172)
63-1744	100 Ohm Carbon Resistor 1/2 W. Insulated
69-38	No. 8-32 x 3/4" R.H.M.S.—Steel N.P.
69-43	No. 8-32 x 3/8" R.H.M.S.—Steel N.P.
73-90	No. 8-32 x 5/16" Hex Head Slotted Set Screw—Conepoint
73-99	No. 8-32 x 1/4" Slab Head Set Screw—Steel Conepoint
73-102	No. 8-32 x 7/16" Slab Head Set Screw—Steel—Conepoint
76-409	Record Ejector Cam Shaft
80-367	Toggle Spring (S-11106)
80-368	Idler Wheel Tension Spring
80-448	Pressure Arm Spring
80-531	Brake Spring
80-538	Landing Adjustment Spring (S-13902)
80-572	Clutch Spring (S-13894)
80-574	Pawl Pusher Bracket Spring (S-13903)
80-582	Pawl Spring (S-13901)
80-584	Tone Arm Lift Pin Spring
80-605	Cobra Cartridge Socket Tension Spring
80-653	Trip Arm Spring (S-13903)
83-1349	Tone Arm Shipping Strip
83-1453	Two Lug Terminal Strip
85-371	3 Position Slide Switch
93-10	.025 x .260 x 5/8" Steel Washer—Cadmium
93-216	.015 x .255 x 7/16" Steel Washer—Cadmium
93-125	No. 6 Int. Shakeproof Lockwasher No. 1206
93-126	No. 8 Int. Shakeproof Lockwasher No. 1208
93-617	Sprocket Shaft Retaining Washer
93-673	Idler Wheel Stud Washer
93-677	Idler Wheel Stud Fishpaper Washer (Large)

93-678	Idler Wheel Stud Fishpaper Washer (Small)
93-679	Idler Wheel Stud Felt Washer (Large)
93-764	Spring Washer—Shakeproof
93-900	Fibre Washer (Motor Mtg.)
93-901	Spring Washer Shakeproof
93-903	Steel Washer—Copper Flash (Motor Mtg.)
93-905	Spring Washer—Shakeproof No. 3502-16-01
94-415	Tone Arm Locating Bushing
112-450	No. 4-40 x 1/8" Phillips Binding Hd. M.S. Steel Cad. Pl.
112-451	No. 8 x 5/16" B.H. Self Tapping Screw—Stan-Tap—Cad.
112-581	No. 6 x 3/8 R.H. Self Tapping Screw
112-619	Cobra Tone Arm Housing Mtg. Screws
112-687	Pivot Screw
112-688	No. 8 x 3/8" Flat Hd. Screw—Shakeproof Type 25—Cad. Pl.
112-689	No. 8 x 3/8" R.H. Screw—Shakeproof Type 25—Cad. Pl.
112-706	No. 4-40 x 3/16" lg. R.H.M.S. (Sems)—Steel N.P.
112-719	No. 6 x 3/8" Flat Head Screw—Self Tapping.
114-88	No. 8-32 x 1/2" Hex Acorn Hd. M.S.—Steel N.P.
114-201	No. 8-32 x 5/16" Hex Head Slotted—STAN-TAP—Thread Forming Screw—Cad. Pl.
114-248	No. 6-20 x 5/16" Hex Head Slotted—Self Tapping Screw
117-133	Record Selector Lever
118-40	Record Selector Link
125-45	Rubber Grommet
125-60	Pressure Arm Grommet
125-61	Rubber Grommet
128-20	Record Ejector Cam
128-40	Record Selector Cam
141-108	A.C. Motor—60 Cycles
148-83	Cobra Tone Arm Housing
148-87	Record Pressure Arm
166-41	Rubber Bumper
188-27	Record Spindle Retaining Washer
188-32	Retaining Ring
188-52	Retaining Ring
214-5	Sprocket Drive Chain

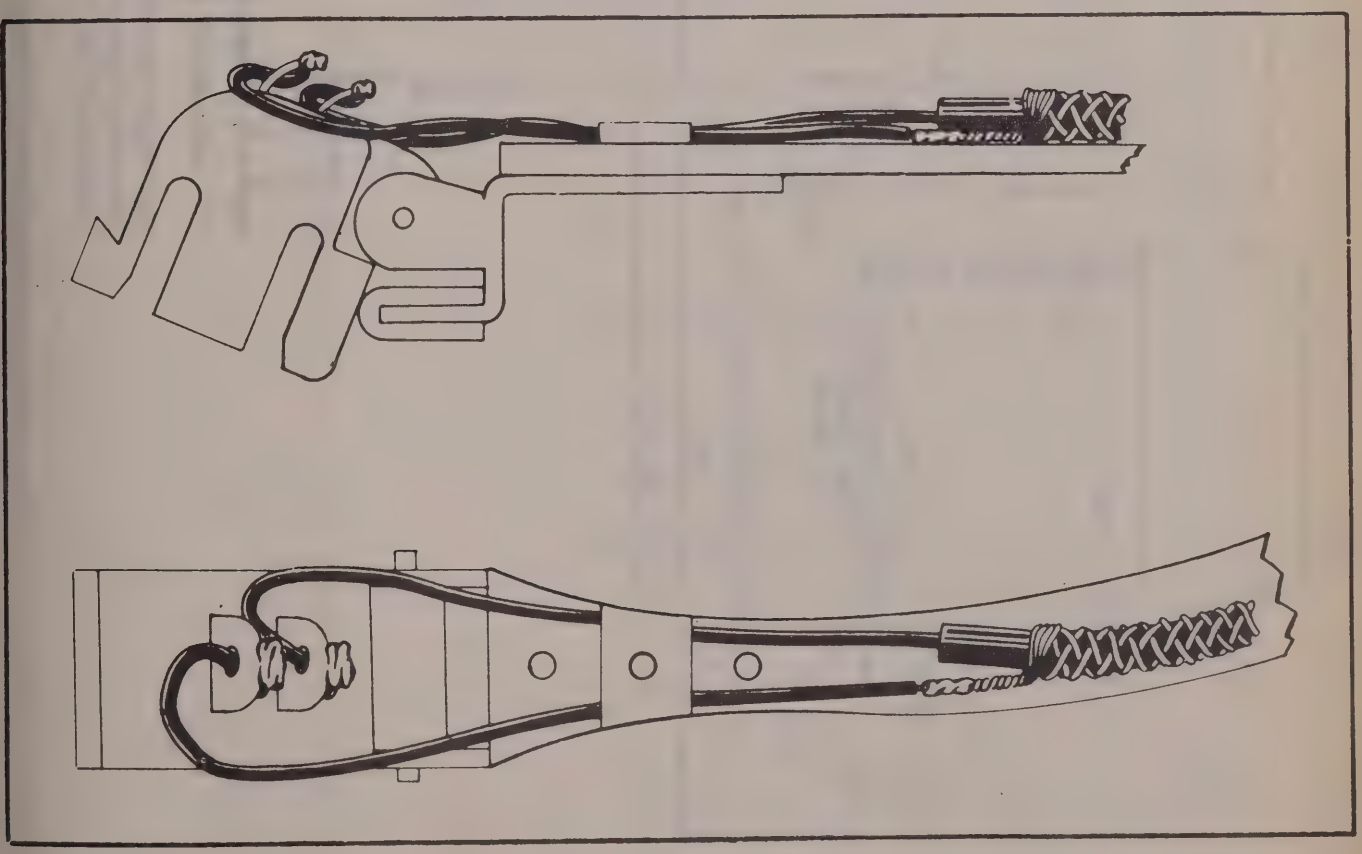


Fig. 13. Needle Cartridge Socket Connections.

Fig. 13 shows how the leads are connected to the Needle Cartridge Socket. The lead and insulation are run through the hole in the contact and the lead is soldered with a light soldering iron. Great care must be exercised, and very little heat applied as the socket is made of lucite and will burn easily. The complete lead, socket and bracket are supplied as S13062.

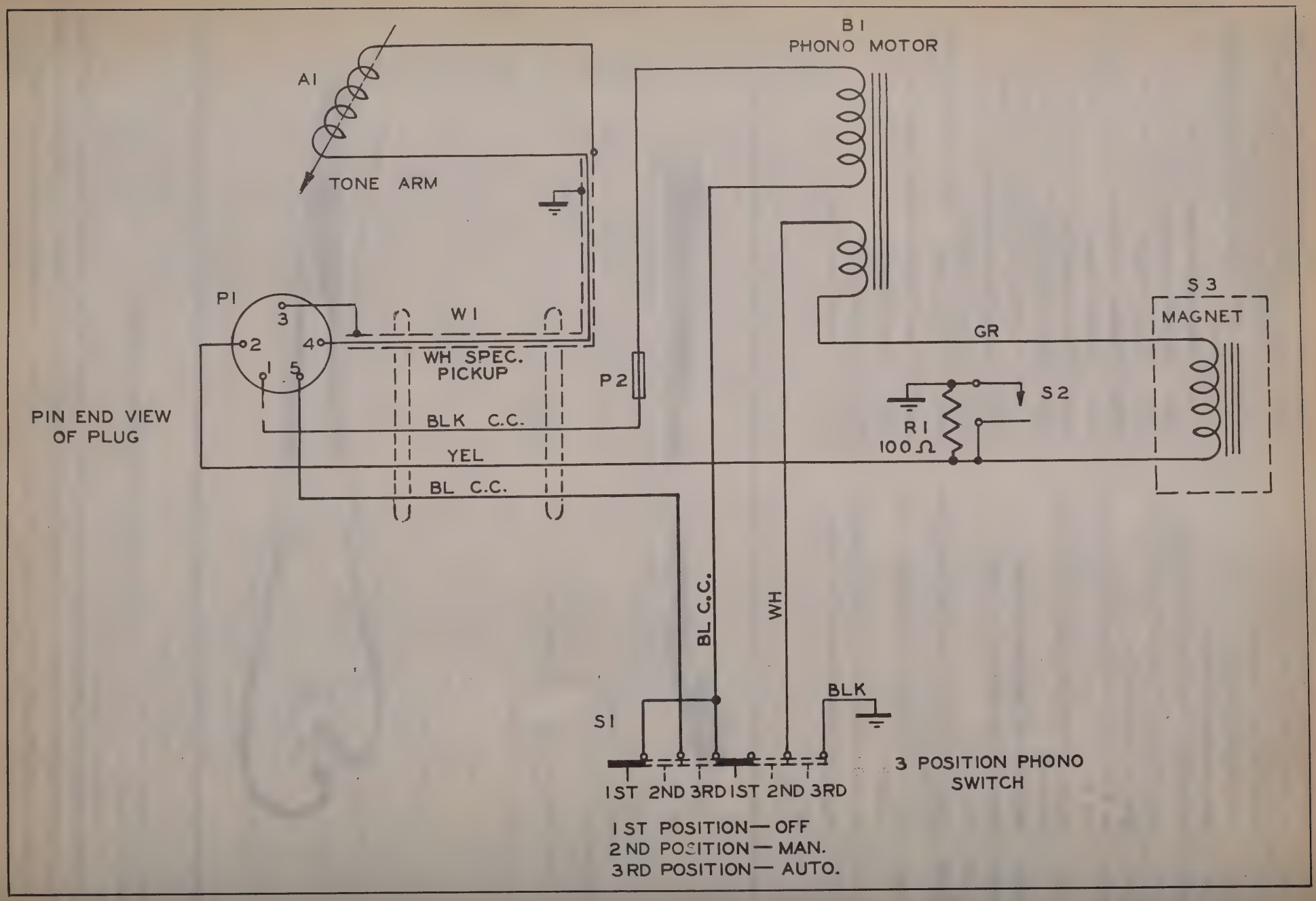


Fig. 14. Schematic Diagram of Record Changer

MEMO

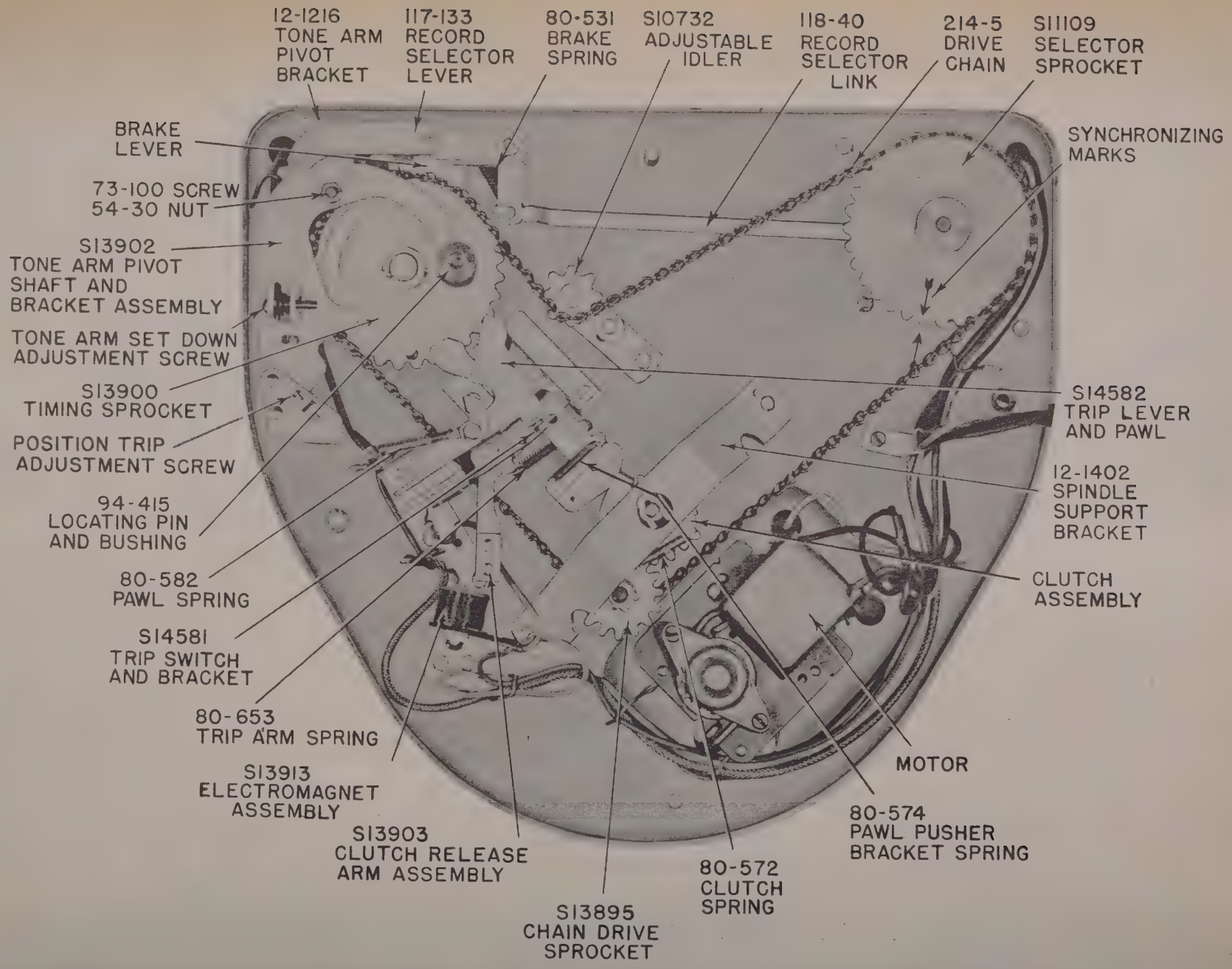
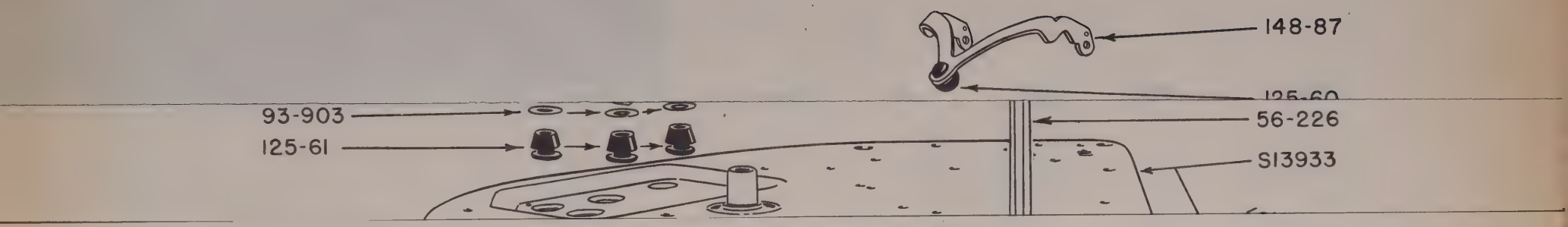


Fig. 15. Bottom View of Record Changer.


148-87
93-903
125-61
56-226
S13933

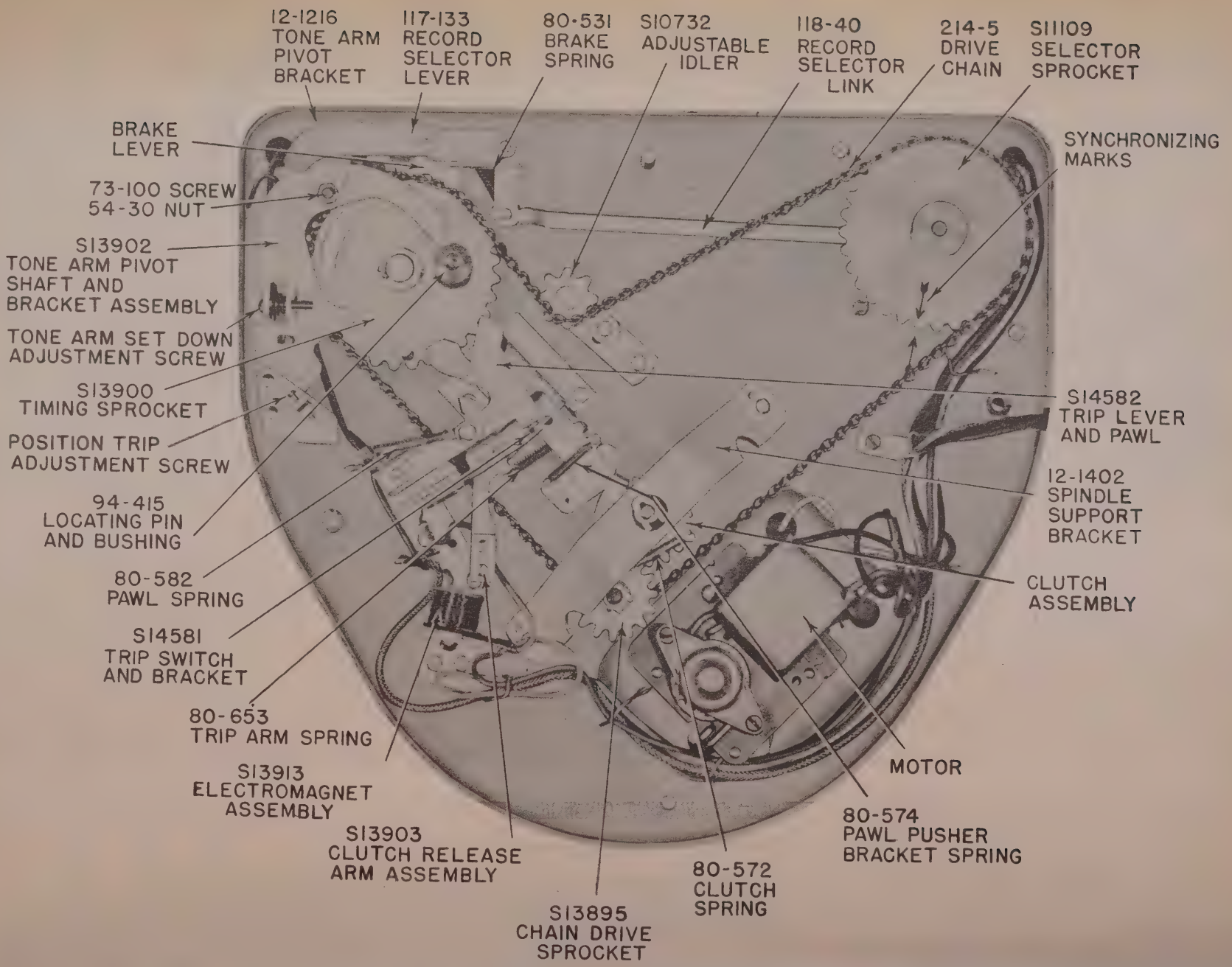
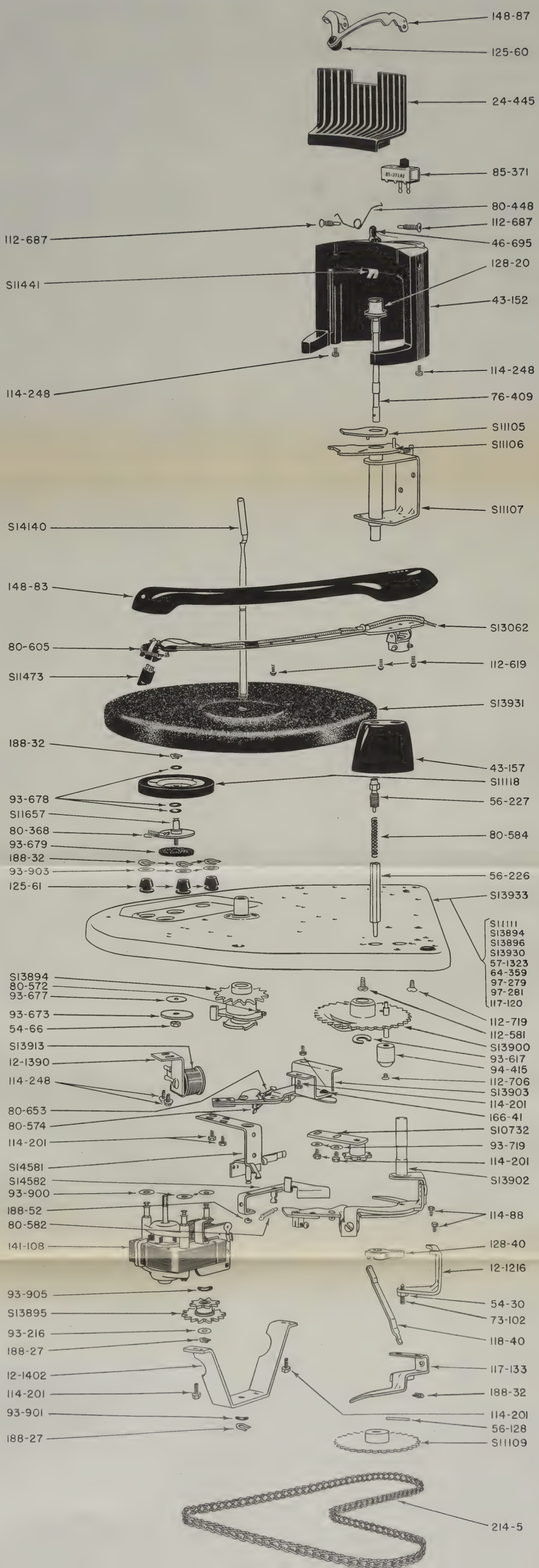


Fig. 15. Bottom View of Record Changer.


148-87
125-60
24-445
85-371
80-448
112-687
46-695
112-687
S11441
128-20
43-152
114-248
114-248
76-409
S11105
S11106
S11107
S14140
148-83
S13062
80-605
112-619
S11473
S13931
188-32
43-157
S11118
93-678
56-227
S11657
80-368
80-584
93-679
188-32
93-903
56-226
125-61
S13933
S11111
S13894
S13896
S13930
57-1323
64-359
97-279
97-281
117-120
S13894
80-572
93-677
112-719
93-673
112-581
54-66
S13900
S13913
93-617
12-1390
94-415
114-248
112-706
S13903
80-653
114-201
80-574
166-41
S10732
114-201
93-719
114-201
S14581
S13902
S14582
93-900
188-52
114-88
80-582
141-108
128-40
12-1216
93-905
54-30
S13895
73-102
93-216
118-40
188-27
117-133
12-1402
188-32
114-201
93-901
114-201
56-128
188-27
S11109
214-5

Copyright 1948, ZRC

Printed in U.S.A.

SERVICE MANUAL

MODELS S-13675 S-14002
S-14006 S-14008

AUTOMATIC RECORD CHANGERS

ZENITH RADIO CORPORATION

CHICAGO 39, ILLINOIS, U. S. A.

TO THE SERVICE MAN:

This Service Manual has been prepared for the purpose of assisting the Service Man in his work of caring for the Record Changer mechanism, whether he is called to remedy some difficulty, or to insure the continued satisfactory operation. The Zenith Automatic Record Changers are constructed with a minimum of working parts, and in operation are simple and reliable. However, as is the case with all mechanical units, misalignment and trouble may occasionally develop. The information presented in this book will enable the Service Man to render quick and accurate service.

Service notes for models S-13675, S-14002, S-14006, and S-14008 have been combined in this manual. Except for slight mechanical, electrical and color variations, these models are alike. The adjustments that the serviceman will be called to make will be the same for all models.

Models S-13675 (maroon) and S-14006 (black) have the automatic shut-off feature and are identical mechanically. Models S-14002 (maroon) and S-14008 (black) have slight electrical differences.

For convenience, the Operating Instructions supplied with each Record Changer are summarized as follows: The Record Changer will automatically play up to fourteen 10 inch or twelve 12 inch records at one loading, or up to twelve 10 and 12 inch records intermixed. The Record Stack rests on the Spindle and the Record Shelf. The Selector Sprocket drives the Ejector Cam which pushes the records off the Shelf and Spindle allowing them to drop on the Turntable. To load for automatic operation, swing the Pressure Bar to the right, place the stack of records on the Spindle, swing the Pressure Bar to the left until it rests on the record stack, set the OFF-MAN-AUTO switch to AUTO and press the Record Change button. Models S-14002 and S-14008 will play the entire selection of records and repeat the last record until turned off. Models S-13675 and S-14006 will automatically shut off after the last record is played.

For manual operation set the OFF-MAN-AUTO switch to MAN and play the records singly as on a non-automatic record player.

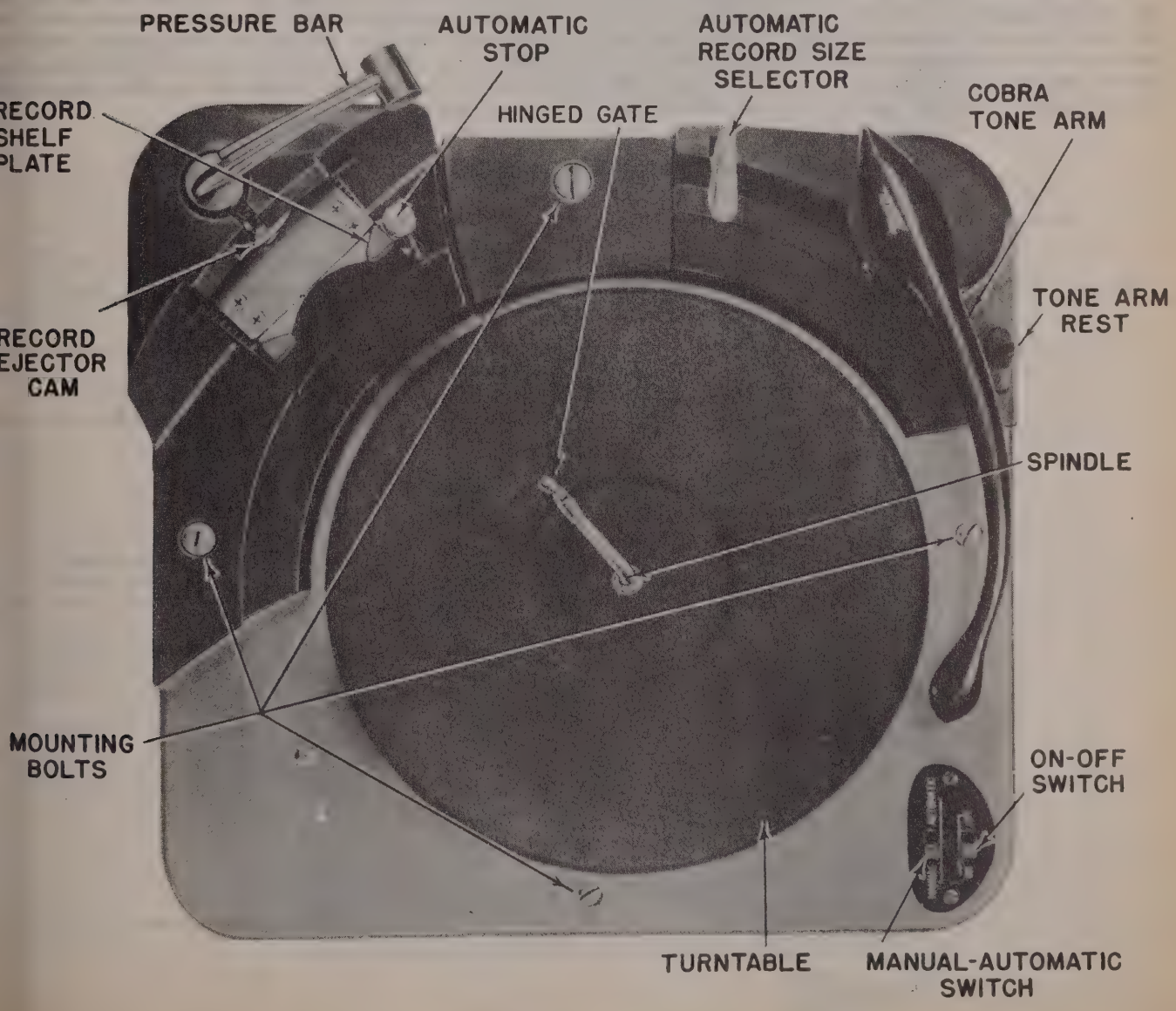


Fig. 1. Top View S-13675 and S-14006 Record Changers.

DESCRIPTION OF CYCLING

The phono motor friction drives the idler wheel. The idler wheel rim drives the turntable, and the turntable shaft. To the turntable shaft is attached the segmented clutch drive plate. The pawl on the clutch drive sprocket assembly engages the drive plate, causing the sprocket to rotate. The pawl pusher lever on the clutch release arm assembly causes the clutch to engage or disengage.

Closing either the trip switch or the record change switch energizes the solenoid. The magnetic flux of the solenoid attracts the clutch release lever causing the mechanism to trip and move the pawl pusher lever away from the clutch pawl. This action allows the clutch pawl spring to pull the pawl into position for the drive plate segment to engage and start the clutch sprocket rotating. The clutch sprocket is meshed with the chain drive sprocket and the chain drives the selector and timing sprockets.

The timing sprocket completes 7 functions through 360° rotation. These functions are as follows: 1. Applies the tone arm brake. The brake lever is actuated by the brake stud on the timing sprocket. The brake prevents coasting and erratic landing of the needle. 2. The inclined groove pushes the lift pin upward. The lift pin raises and lowers the tone arm. 3. The locating pin laterally swings the tone arm off the record stack. 4. The locating pin or bushing swings the tone arm over the starting groove of the record. With 12″ records, the locating pin swings the tone arm in while the locating bushing swings the tone arm with 10″ records. The locating bushing is pushed upward by the discriminator trip plate. 5. The reset stud resets the clutch trip mechanism and moves the pawl pusher lever in the path of the clutch pawl. 6. The lift pin lowers the tone arm over the starting groove of the record. 7. The brake stud releases the brake. When the clutch pawl hits the pawl pusher lever, the clutch is disengaged.

The selector sprocket actuates the record ejector cam, and must be timed with the timing sprocket to drop the records on the turntable when the tone arm is at its greatest outward swing. This occurs immediately after the No. 3 function of the timing sprocket.

As the record is played, the tone arm gradually moves toward the center. The ratchet on the tone arm control lever moves toward the pawl on the trip switch lever. As the ratchet comes in contact with the pawl, the oscillating action produced by the eccentric groove on the record causes the trip switch to close, complete the solenoid circuit and repeat the cycle. If the record does not have an eccentric groove, the position trip will close the trip switch and start the next cycle.

Noise and microphonics are eliminated by muting the phono pre-amplifier during the record change cycle. The tone arm brake lever actuates the muting switch. When the contacts are closed, a low reactance capacitor is connected across the audio output making the amplifier inoperative during the change cycle.

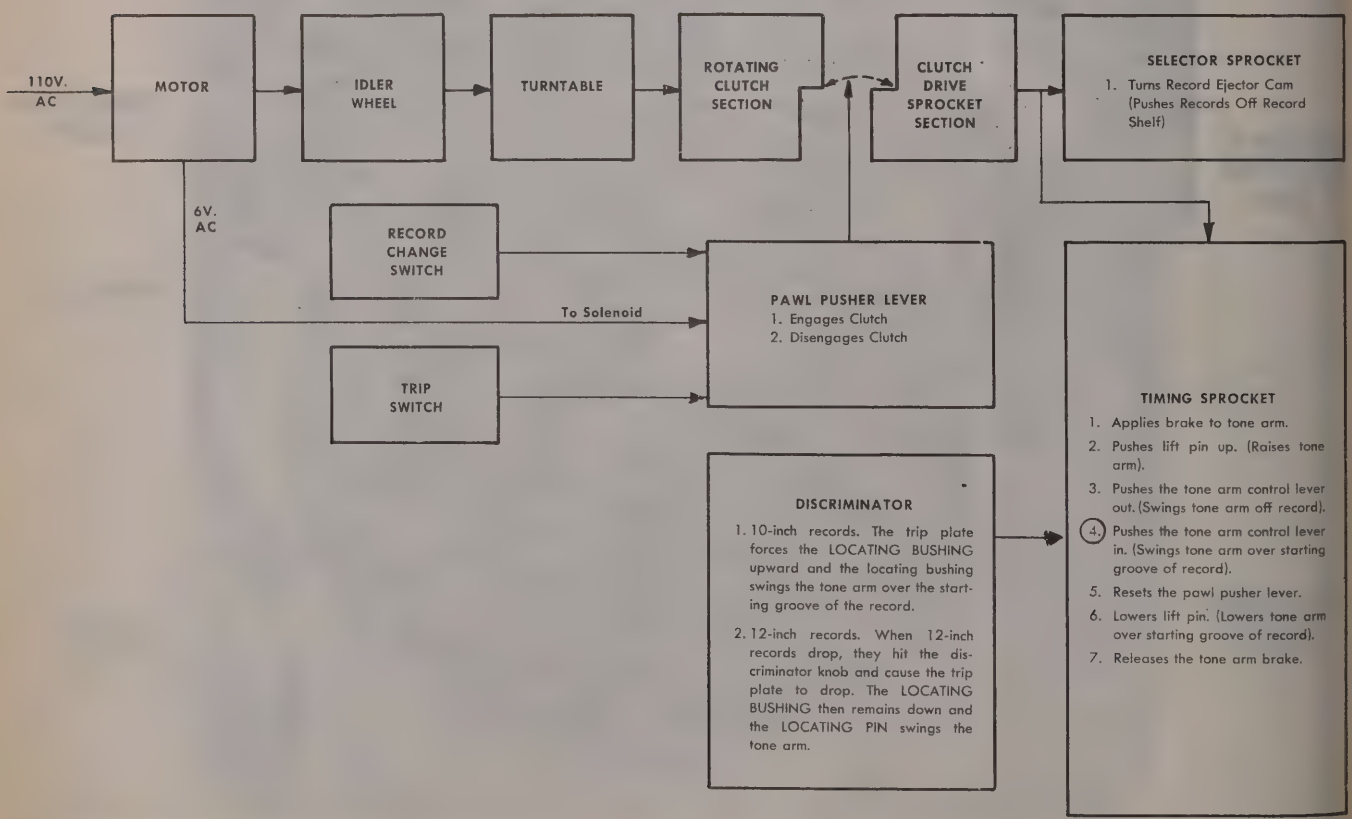

110V. AC
MOTOR
IDLER WHEEL
TURNTABLE
ROTATING CLUTCH SECTION
CLUTCH DRIVE SPROCKET SECTION
SELECTOR SPROCKET
1. Turns Record Ejector Cam (Pushes Records Off Record Shelf)
6V. AC
RECORD CHANGE SWITCH
To Solenoid
TRIP SWITCH
PAWL PUSHER LEVER
1. Engages Clutch
2. Disengages Clutch
TIMING SPROCKET
1. Applies brake to tone arm.
2. Pushes lift pin up. (Raises tone arm).
3. Pushes the tone arm control lever out. (Swings tone arm off record).
4. Pushes the tone arm control lever in. (Swings tone arm over starting groove of record).
5. Resets the pawl pusher lever.
6. Lowers lift pin. (Lowers tone arm over starting groove of record).
7. Releases the tone arm brake.
DISCRIMINATOR
1. 10-inch records. The trip plate forces the LOCATING BUSHING upward and the locating bushing swings the tone arm over the starting groove of the record.
2. 12-inch records. When 12-inch records drop, they hit the discriminator knob and cause the trip plate to drop. The LOCATING BUSHING then remains down and the LOCATING PIN swings the tone arm.

Fig. 2. Sequence of Operation—Zenith Record Changers.

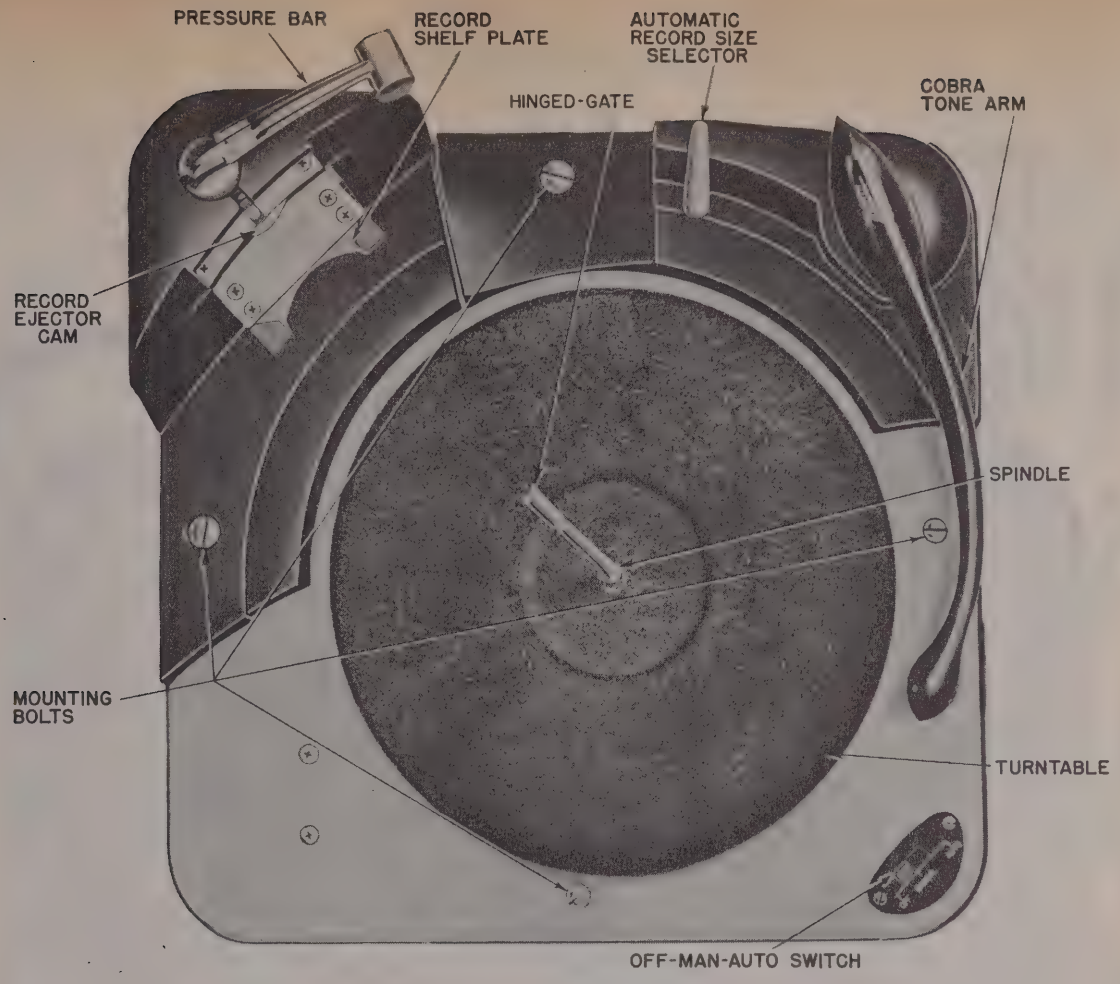


Fig. 3. Top View S-14002 and S-14008 Record Changers.

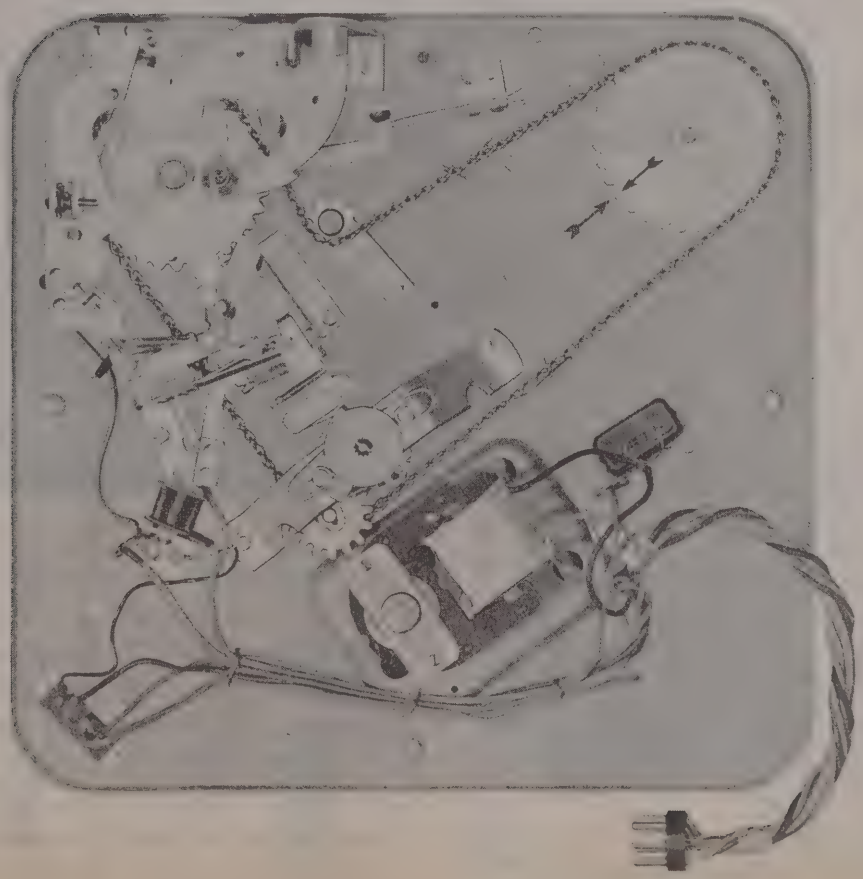
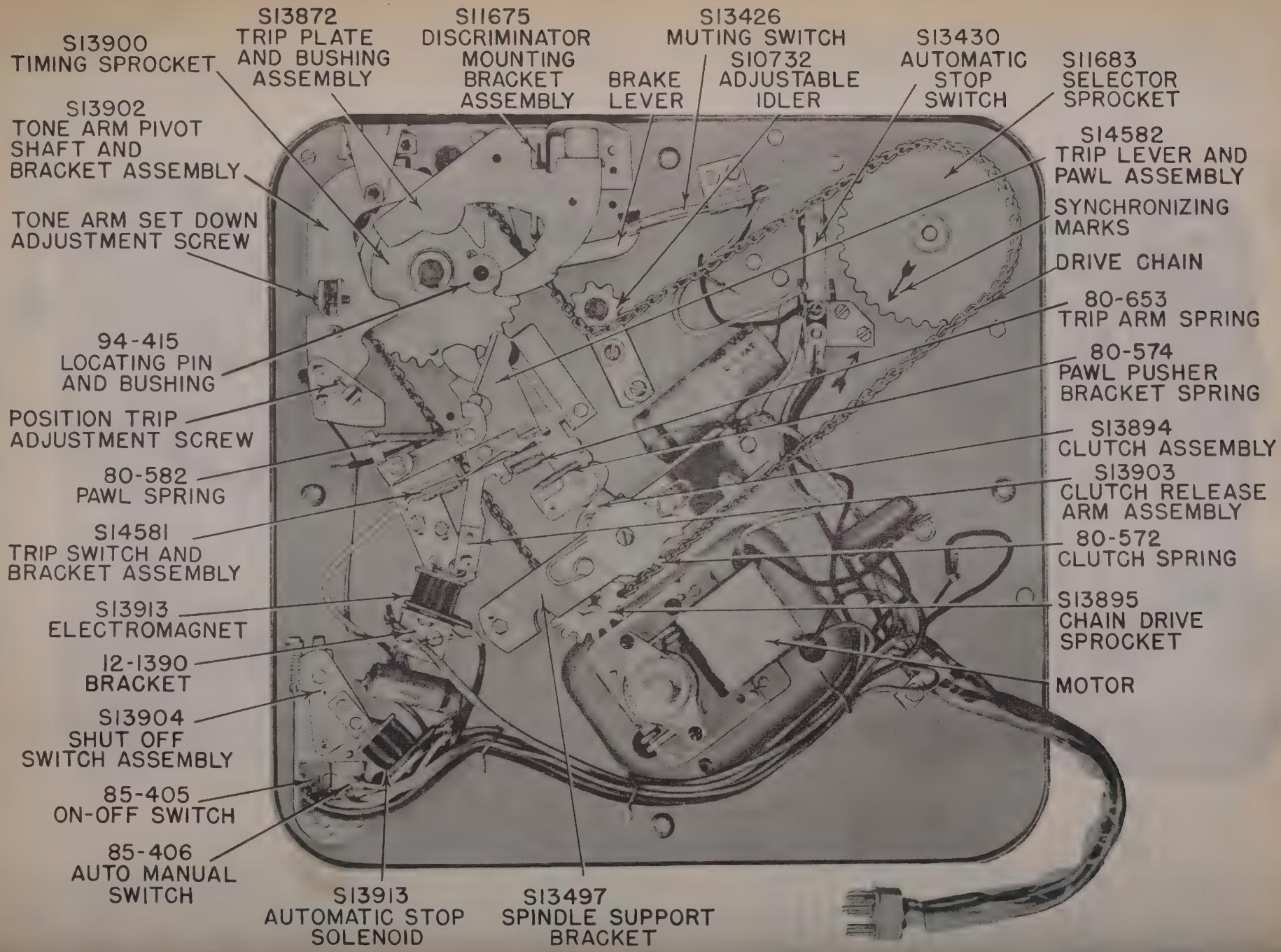


Fig. 4. Bottom View S-14002 and S-14008 Record Changers.


S13900
TIMING SPROCKET
S13872
TRIP PLATE
AND BUSHING
ASSEMBLY
S11675
DISCRIMINATOR
MOUNTING
BRACKET
ASSEMBLY
BRAKE
LEVER
S13426
MUTING SWITCH
S10732
ADJUSTABLE
IDLER
S13430
AUTOMATIC
STOP
SWITCH
S11683
SELECTOR
SPROCKET
S13902
TONE ARM PIVOT
SHAFT AND
BRACKET ASSEMBLY
TONE ARM SET DOWN
ADJUSTMENT SCREW
94-415
LOCATING PIN
AND BUSHING
POSITION TRIP
ADJUSTMENT SCREW
80-582
PAWL SPRING
S14581
TRIP SWITCH AND
BRACKET ASSEMBLY
S13913
ELECTROMAGNET
12-1390
BRACKET
S13904
SHUT OFF
SWITCH ASSEMBLY
85-405
ON-OFF SWITCH
85-406
AUTO MANUAL
SWITCH
S13913
AUTOMATIC STOP
SOLENOID
S13497
SPINDLE SUPPORT
BRACKET
S14582
TRIP LEVER AND
PAWL ASSEMBLY
SYNCHRONIZING
MARKS
DRIVE CHAIN
80-653
TRIP ARM SPRING
80-574
PAWL PUSHER
BRACKET SPRING
S13894
CLUTCH ASSEMBLY
S13903
CLUTCH RELEASE
ARM ASSEMBLY
80-572
CLUTCH SPRING
S13895
CHAIN DRIVE
SPROCKET
MOTOR

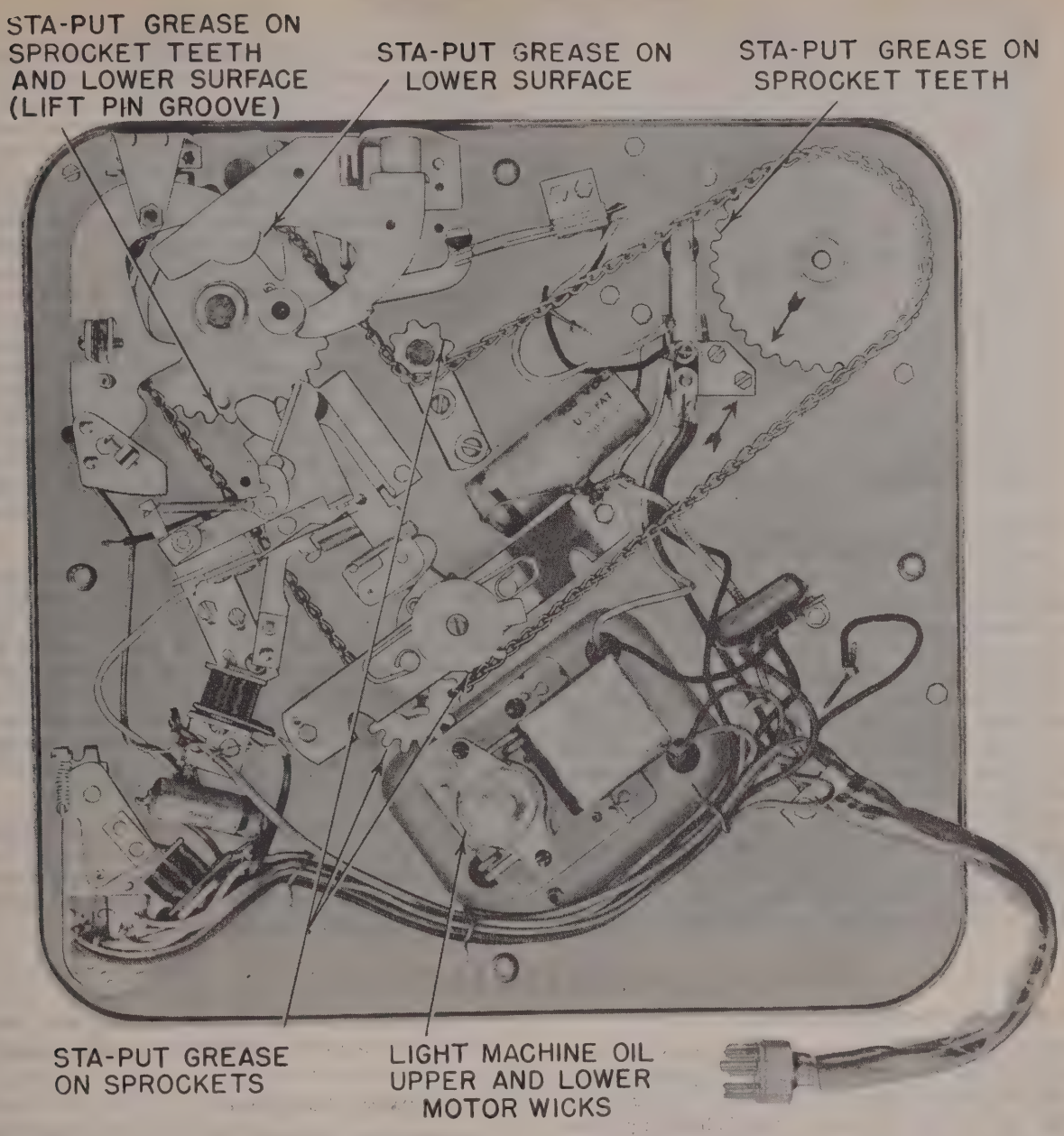

STA-PUT GREASE ON SPROCKET TEETH AND LOWER SURFACE (LIFT PIN GROOVE)
STA-PUT GREASE ON LOWER SURFACE
STA-PUT GREASE ON SPROCKET TEETH
STA-PUT GREASE ON SPROCKETS
LIGHT MACHINE OIL UPPER AND LOWER MOTOR WICKS

Fig. 6. Lubrication Bottom of Record Changer.

Sta-Put grease No. 512 (light grease of the vaseline type) and light machine oil of No. 10 consistency are used for lubrication throughout.

Figures 6 and 7 indicate the points to be lubricated and the type of lubricant to use. The Motor has two oil wicks, which should be saturated with oil. The Record Spindle Guide Bearing, Idler Wheel Bearing, Lower Drive Shaft Bearing, Drive Shaft Thrust Bearing and the Motor Bearings are of the OILITE type and require very little attention. If squeaks develop, be certain that they are not caused by friction between the Spindle and records on the Turntable. A thin coat of wax on the Spindle will remedy this condition.

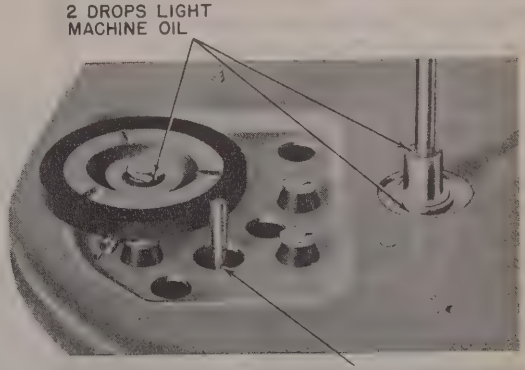


Fig. 7. Lubrication Top of Record Changer.

THEORY OF THE COBRA RADIONIC PICKUP

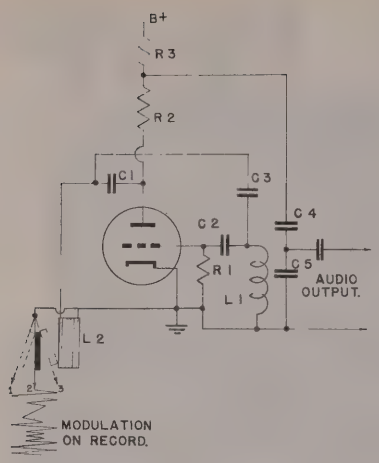


Fig. 8. Simplified Circuit of Oscillator.

The operation of the Cobra pickup is considerably different from Crystal and Dynamic pickups. These pickups generate audio power, while the Cobra controls power generated by a radio frequency oscillator. The triode tube is a modulated oscillator, detector and audio amplifier. The oscillator operates at a frequency of 2.5 Mc. Modulation is accomplished by changing the energy losses in a tuned circuit. These losses may be represented by an equivalent resistance in series with the reactance of the coil. The ratio of the resistance to the reactance determines the efficiency or Q of the coil. The amplitude of the RF voltage developed across this coil by the oscillator will vary with changes in Q.

The grid coil L_1 and other components of the oscillator are mounted in the receiver chassis, while the plate coil L_2 is in the Needle Cartridge with the vane and needle assembly. The coil is fixed and has 40 turns of No. 40 wire (approximate DC resistance 2½ ohms). The stainless steel vane, which is in the field of the coil, is spot welded to the osmium-iridium tipped stylus. Any movement of the stylus will cause a corresponding movement of the vane. As the stylus and vane follow the modulations in the record, changes in the mutual inductance between the vane and coil occur (see Fig. 8). In position 2 the vane is at rest, and a constant RF voltage appears across the plate coil. As the vane is set in motion and reaches position 1, it is at its greatest outward swing from the coil, resulting in low mutual inductance, low reflected resistance, higher Q, and a higher RF voltage across the coil. In position 3 it is at its greatest inward swing; resulting in a high mutual inductance, high reflected resistance, lower Q and a lower RF voltage. It can be seen that the amplitude of the RF voltage which appears across the coil will vary with changes in Q, satisfying the condition for amplitude modulation. The position of the vane changes both the Q and L of the coil. Changes in L shift the frequency slightly, and a certain amount of frequency modulation is present, but since there is no frequency discrimination it remains undetected.

Since the grid and plate coils are part of a single tuned circuit any variations of amplitude of the RF voltage brought about by the changes in Q across the plate coil will also appear across the grid Coil L_1 causing a shift in the average plate current through the plate load resistor across which the audio output voltage is developed. Plate bend detection takes place since only the positive half of the grid swing causes an increase in the average plate current. These changes in the average plate current appear as audio voltage across the plate load resistor.

The 2.5 Mc. RF voltage and the audio voltage both appear at the plate of the oscillator triode. R_2, C_4 and C_5 filter out the RF voltage allowing only the audio component to the grid of the pre-amplifier where it is amplified and reproduced by the loud-speaker.

ADJUSTMENTS

1. Tone Arm Set Down Adjustment.

The Tone Arm Set Down Adjustment determines the landing position of the needle on the starting groove of the record. The adjustment screw can be reached with a screwdriver (Fig. 10). The tone arm must be held in the rest position while the adjustment is made. Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

2. Tone Arm Height Adjustment.

The Tone Arm vertical rise is governed by the Lift Pin. The Lift Pin is adjustable (see Fig. 9). Too long a Lift Pin will cause the Tone Arm to hit the underside of the records on the Spindle. If the Lift Pin is short, the needle will not clear fourteen records on the Turntable. To make the proper adjustment, trip the Clutch by hand and rotate the Turntable clockwise until the Tone Arm starts to swing toward the Spindle. Gently push the Tone Arm as close to the Spindle as it will go, place a record on the Spindle and observe the spacing between it and the Tone Arm. The spacing "A" (Fig. 11), should be approximately the thickness of a record.

Fig. 9. Lift Pin.

If the spacing is incorrect, lift the Tone Arm, remove the Lift Pin, and adjust the Lift Pin to the proper length.

3. Trip Switch Adjustment.

As the record is played, the ratchet on the tone arm pivot shaft engages the trip pawl. The oscillating action developed by the eccentric groove on the record closes the trip switch contacts and allows the solenoid to become energized. The magnetic flux attracts the trip lever which moves the pawl pusher lever from the path of the clutch pawl. This allows the clutch to engage and start the next cycle.

The gap between the trip switch contacts should be approximately 1/16". If the spacing is incorrect, bend the contact spring. If the contact spring tension is too great, the needle may not follow the oscillating groove on the record. To adjust the spring tension, insert a screwdriver between the contact and guide springs and bend the contact spring (Fig. 10) until an approximate pressure of one ounce is necessary to move the contact spring from the guide spring. Be certain that the contact spring exerts some pressure on the guide spring after adjustment.

The spacing between the trip magnet and trip lever should be approximately 3/32".

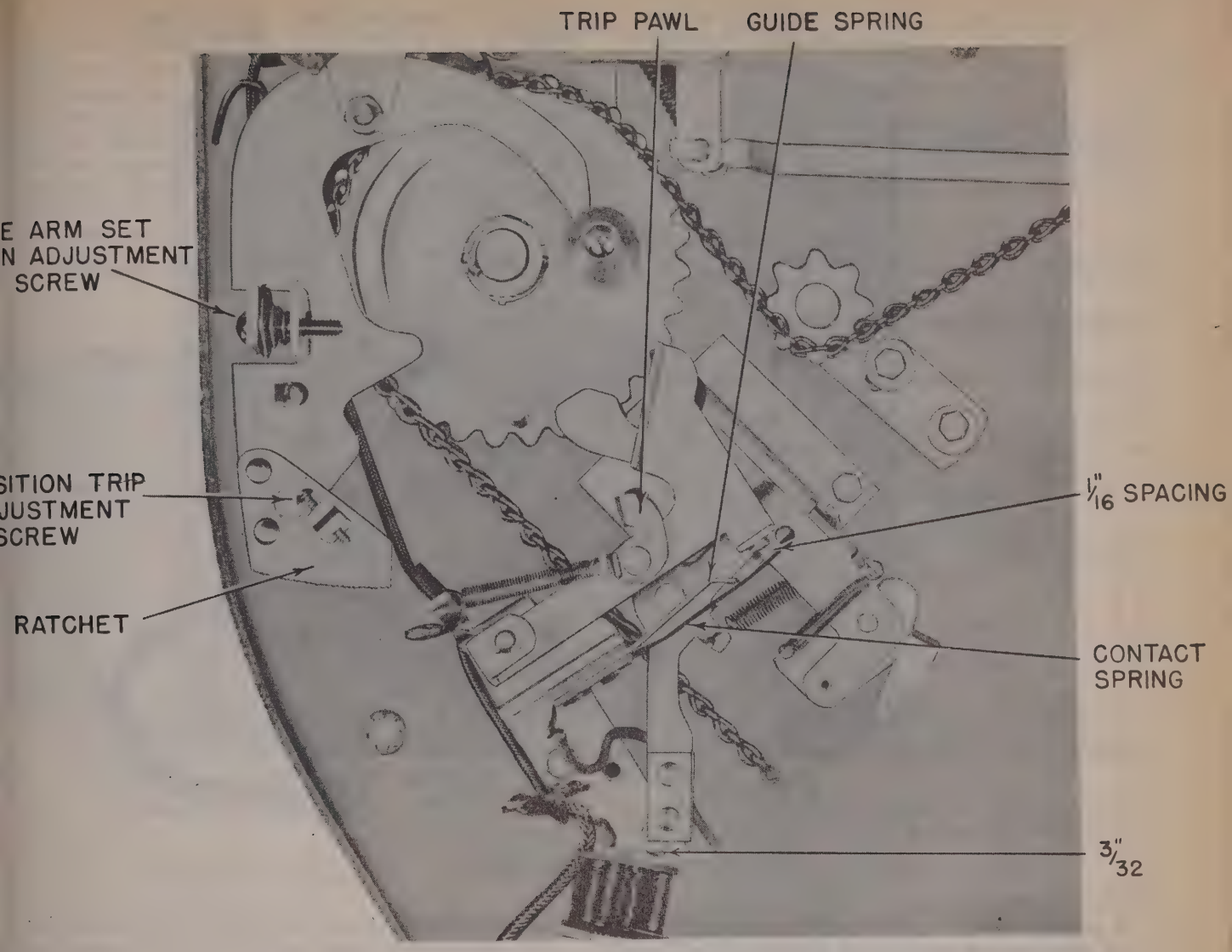


Fig. 10. Tone Arm Set Down, Position Trip and Trip Switch Adjustments.

4. Position Trip Adjustment.

The Position Trip does not depend on an eccentric groove in the record to start the record change cycle, but will trip the mechanism whenever the needle comes within a pre-determined distance from the Spindle. Older type records that do not have an eccentric groove can in most cases be played automatically by the proper adjustment of the Position Trip. Under normal conditions with the needle approximately 1 7/8" from the center of the Spindle, adjust the Position Trip Adjustment Screw (Fig. 10) until the Trip Switch contacts close. This distance is generally satisfactory since no modern record will be cut off before it has completed its play, and none will fail to trip the mechanism at the end. In special cases, screw the Position Trip Adjustment Screw clockwise for earlier tripping and counter-clockwise for later tripping as the individual case may be.

It may be impossible to find an adjustment that will always trip the mechanism and never cut off on all type records, and in these special cases the record must be played manually.

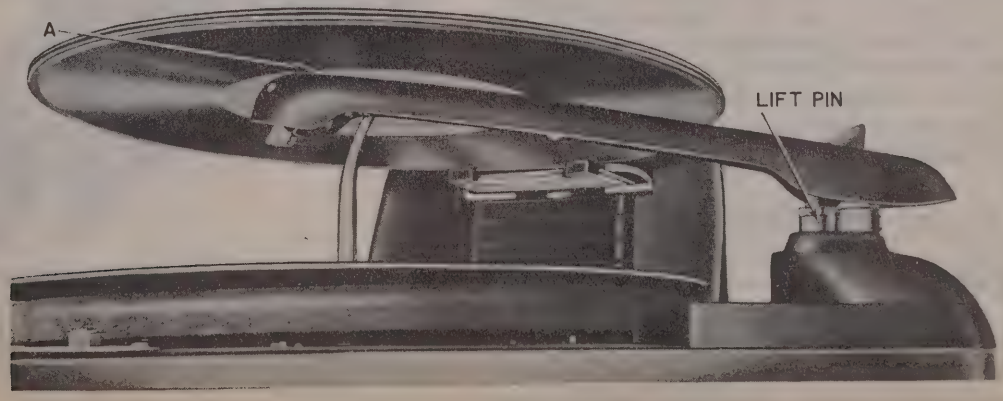


Fig. 11. Tone Arm Height Adjustment.

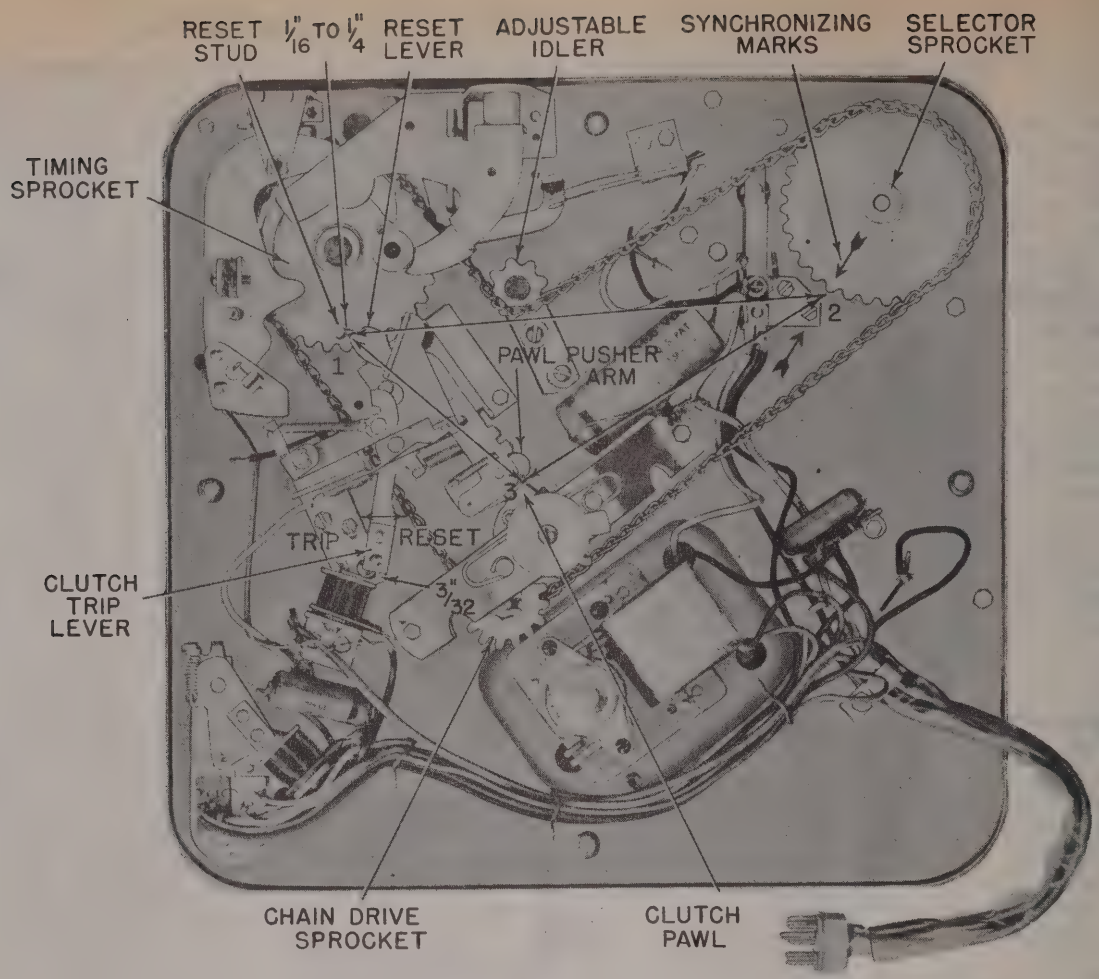


Fig. 12. Synchronization.

5. Synchronization.

A properly timed changer drops records on the turntable when the tone arm is at its greatest outward swing. Improper timing results in the records hitting the tone arm. The record changer is kept in time by the drive chain. If the chain is removed, the changer must be synchronized.

Fig. 12 indicates the correct position of the timing sprocket, selector sprocket and the clutch. To synchronize, study Fig. 12 and proceed as follows:

1. Reset the clutch trip lever.

2. Turn the timing sprocket until the reset stud is approximately 1/16" from the reset lever (1). Turn the selector sprocket until the synchronizing mark lines up with the mark on the base plate (2). THESE POSITIONS MUST BE MAINTAINED DURING THE NEXT OPERATION.

3. Thread the chain over the timing sprocket, chain drive sprocket, adjustable idler, selector sprocket and set the adjustable idler for medium tension of the chain. Check the position of the synchronizing marks and the reset stud.

4. Remove the retaining washer and lift the chain drive sprocket until the gears disengage.

5. Turn the clutch until the clutch pawl touches the pawl pusher lever (3).

6. Lower the chain drive sprocket until it engages the clutch gears and reinsert the retaining washer.

REMOVING THE TURNTABLE

Hold the clutch by inserting a wide blade screwdriver against the spindle bracket and a segment of the drive plate. Apply a twisting, pulling force to the turntable.

Before seating the turntable, be certain that the idler wheel is pushed inside the turntable rim.

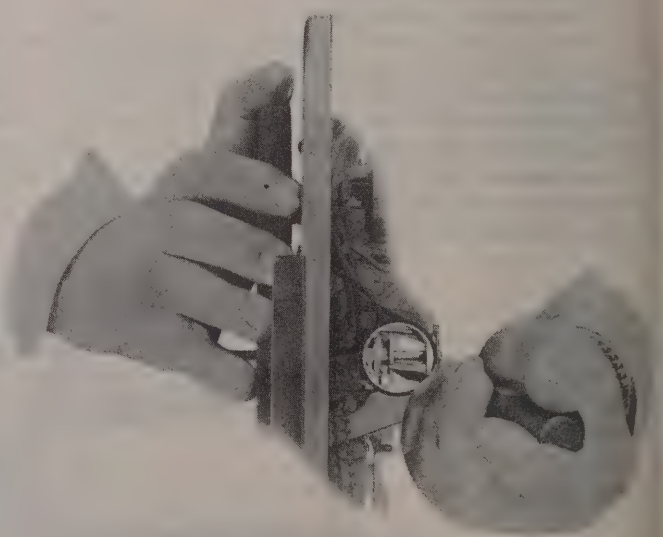


Fig. 13. Removing the Turntable.

REPLACING THE MOTOR

When a replacement Motor is ordered, include the line voltage and frequency of the receiver.

To replace the Motor, unsolder the connecting leads, remove the Turntable, the three retaining washers and allow the Motor to drop out. When the Motor is installed do not draw the connecting leads tight as this will prevent the Motor from "floating" on its mounts. Be certain that the retaining washers are crimped and the leads securely soldered and taped.

REPLACING THE CHAIN

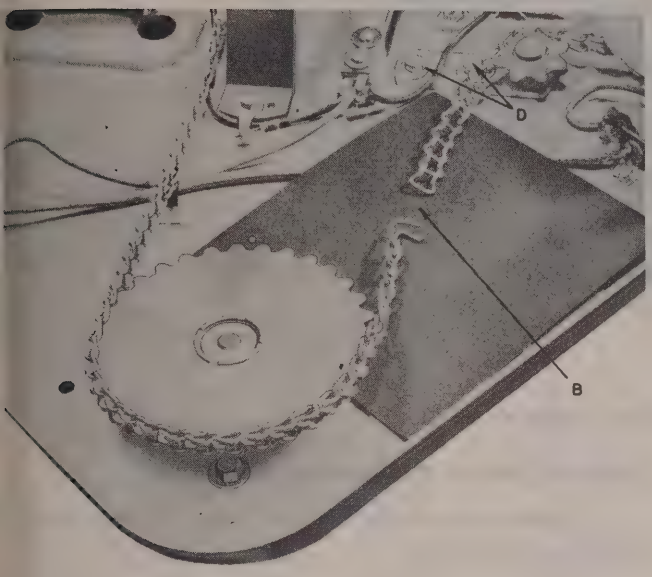


Fig. 14. Replacing the Chain.

The chain may be removed by loosening the adjustable idler (Screws "D," Fig. 14), and opening one of the links (B). It will be noted that on some models the open ends of the links face inward while on others outward as in Fig. 14. The reason for this is to get the quietest operation. Normally the open ends of the links will face outward with all replacement chains.

After the chain is threaded in place, carefully close the open link and be certain that there is no stiffness in its action. Read the paragraph on Synchronization before the chain is permanently installed.

TROUBLE SHOOTING

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

a. Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.
b. Check lubrication.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT.

a. Check line voltage and frequency.
b. Check lubrication.
c. Motor windings damaged.
d. Room temperature abnormally low.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START THE RECORD CHANGE CYCLE.

a. See that the OFF-MAN-AUTO switch is set to AUTO.
b. Check Record Change Switch.
c. Check electrical continuity of solenoid circuit.
d. Check the solenoid energizing voltage.

MOTOR FAILS TO RUN EVEN WHEN IT IS DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING.

a. Open windings.
b. Damaged or frozen bearings.
c. Lower Bearing Support Bracket bent. Remove and straighten bracket—Re-center armature.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

a. Changer not "floated" properly. Loosen mounting bolts.
b. Motor retaining rings rubbing on the idler wheel.
c. Motor leads pulled too tight preventing motor from "floating" freely.
d. Noisy Phono Oscillator tube.
e. Impression on Idler Wheel.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES.

a. Cabinet tilted.
b. Badly worn or broken needle cartridge.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

a. Check Tone Arm height adjustment. (Adjustment 2.)

CHANGER CYCLES WITH OFF-MAN-AUTO SWITCH ON MAN.

a. Check OFF-MAN-AUTO switch.
b. Reset stud does not engage clutch reset lever.

TONE ARM FALLS OFF RECORD.

a. Check Tone Arm set down adjustment. (Adjustment 1.)
b. Check Tone Arm Pivot Bracket.
c. Changer not level.

TONE ARM SET-DOWN POSITION VARIES.

a. Check Tone Arm Brake and Spring.
b. Tight Tone Arm Connecting Leads.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

a. See that the Phono Radio switch is on Phono.
b. Check receiver audio by listening to radio.
c. Check the phono oscillator tube.
d. Check Needle Cartridge.
e. Check Tone Arm Housing for broken leads.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

a. Check Tone Arm set down adjustment. (Adjustment 1.)

CHANGER CONTINUES TO CYCLE.

a. Check Trip switch adjustment. (Adjustment 3.)
b. Check Record Change switch.
c. Clutch release mechanism sticks.
d. Pawl pusher lever not reset by reset stud.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

a. See that the OFF-MAN-AUTO switch is set to AUTO.
b. Be certain the record has an eccentric center groove.
c. Check Trip switch.

Fig. 15. Checking Spindle Centering.

RECORD CENTER HOLE WEAR.

a. Record centers oversize.

b. A bent spindle will cause center hole wear due to impeded record injection. To check the spindle position, place a 10" record as shown in Fig. 15. If the spindle is properly centered, a triangle will be formed with the metal ends of the record shelf plate.

SQUEAKS WHEN CHANGER IS IN CYCLE.

a. Friction between Lift Pin and Timing Sprocket. Apply a thin coat of Sta-Put.

MOTOR RUNS BUT TURNTABLE SLIPS OR STOPS.

a. Turntable not fully seated. Tap gently.

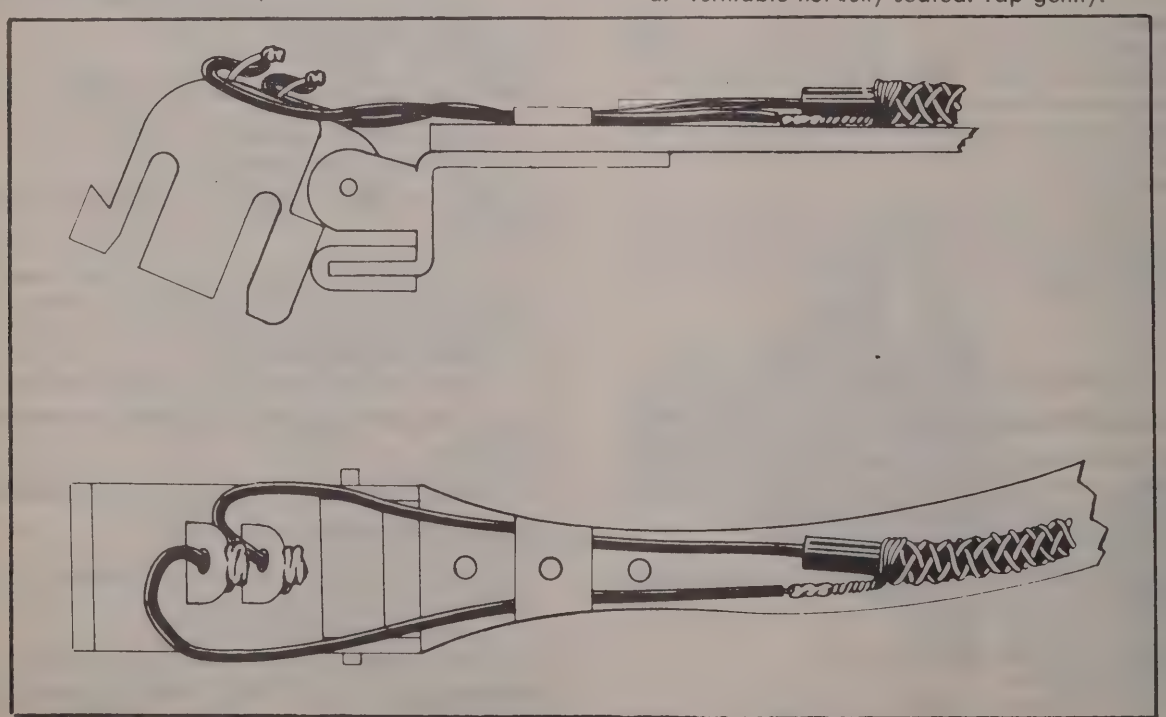


Fig. 16. Needle Cartridge Socket Connection.

Fig. 16 shows how the leads are connected to the Needle Cartridge Socket. The lead and insulation are run through the hole in the contact and the lead is soldered with a light soldering iron. Great care must be exercised, and very little heat applied as the socket is made of lucite and will burn easily. The complete lead and socket are supplied as S-12633.

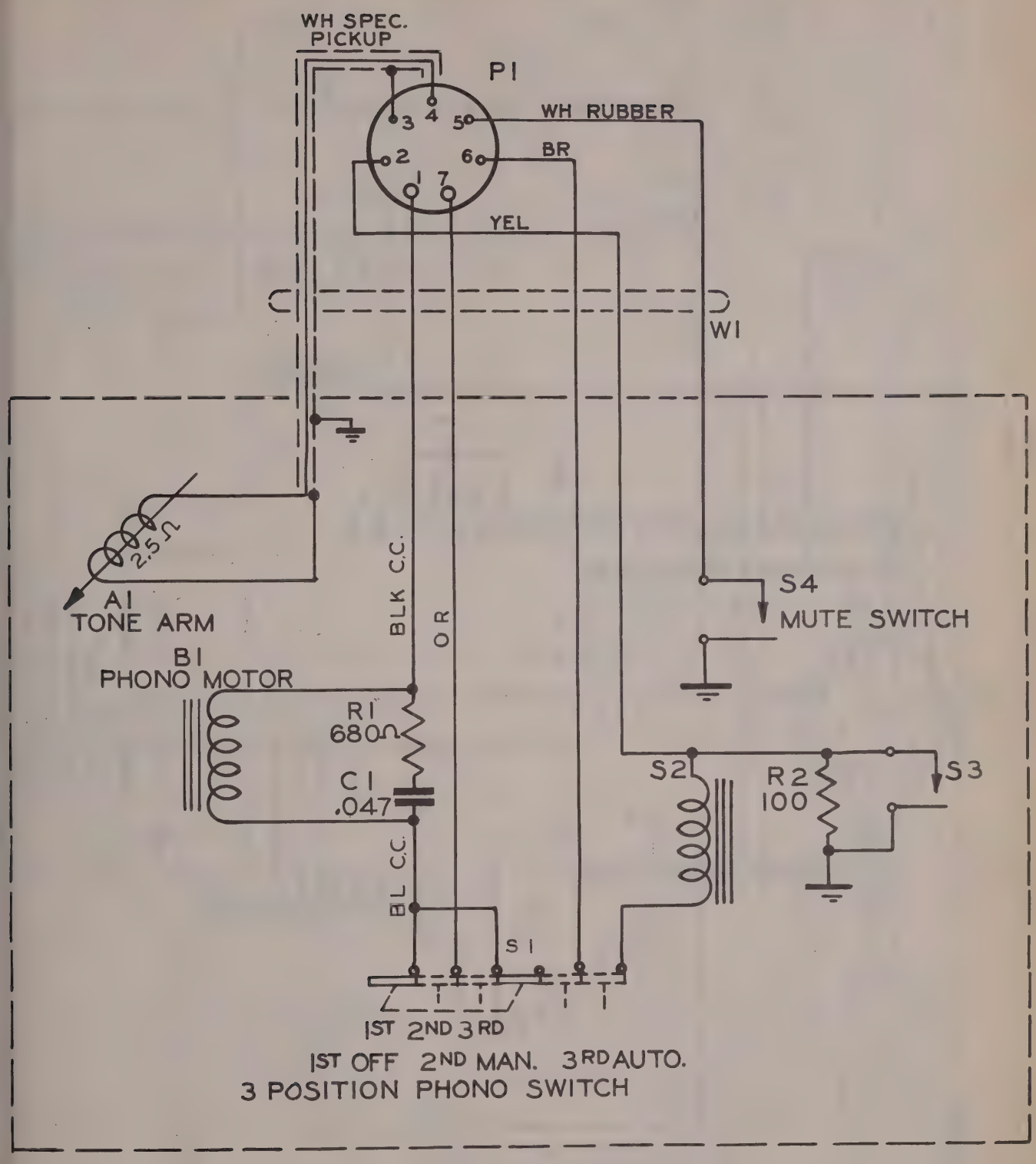


Fig. 17. S-14002 Schematic Diagram.

PIN END VIEW OF PLUG

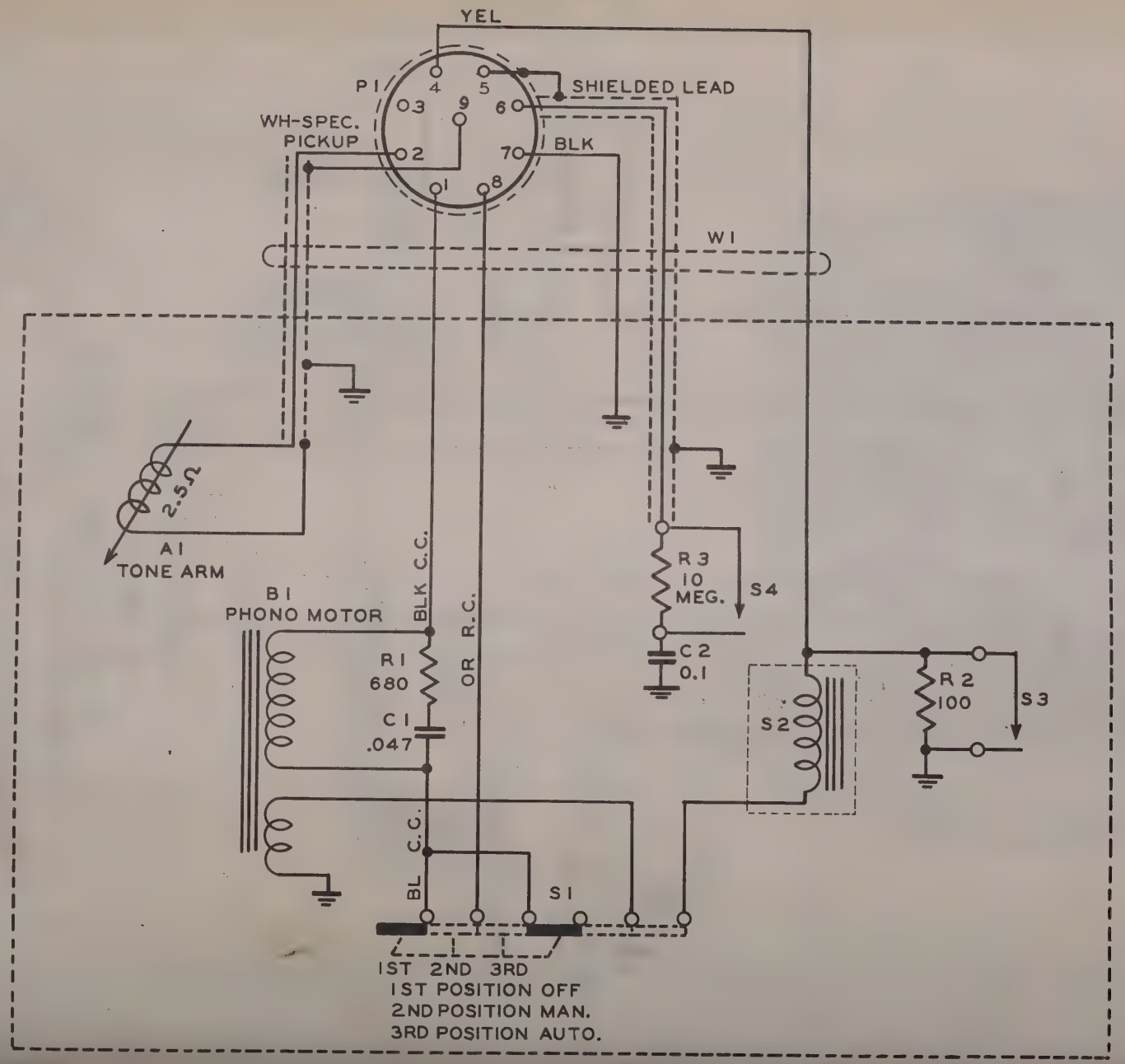


Fig. 18 S-14008 Schematic Di

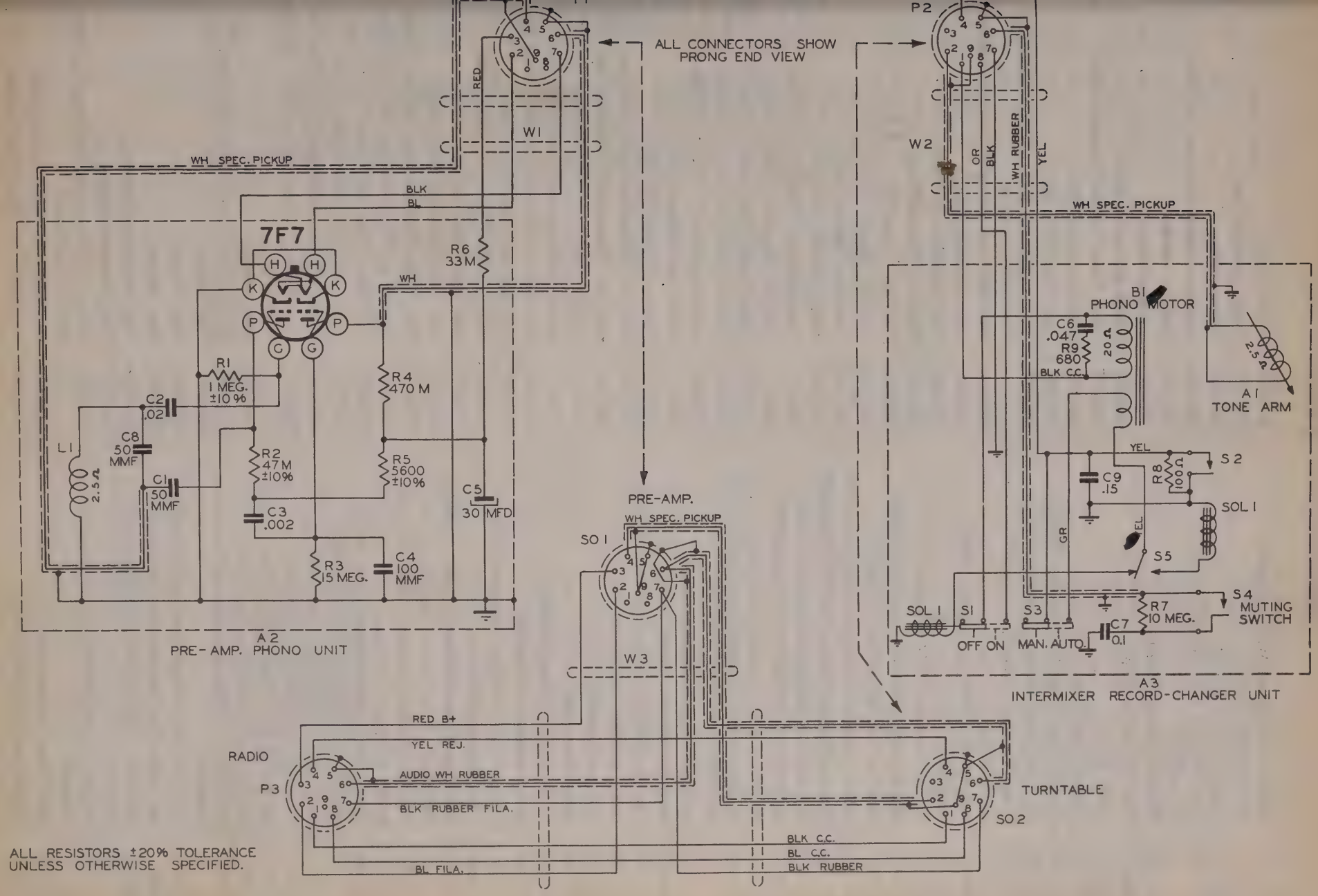


Fig. 19. S-13675 and S-14006 Schematic Diagram.

12-1124	Record Ejector Plate Mounting Bracket (S-13675, S-14006)
12-1216	Tone Arm Pivot Bracket
12-1340	Record Ejector Plate Mounting Bracket (S-11674)
12-1390	Solenoid Mounting Bracket
15-64	Plug Cap and Insulator
19-88	Cable Clip
19-150	Housing Cover Clip
22-417	.1 Mfd. Paper Dielectric Capacitor 600 V.
22-1570	.05 Mfd. Paper Dielectric Capacitor 400 V.
24-354	Record Ejector Housing Cover (S-14006, S-14008)
24-432	Record Ejector Housing Cover (S-13675, S-14002)
43-103	Tone Arm Housing (S-14006, S-14008)
43-147	Record Ejector Housing (S-13675, S-14002)
43-148	Tone Arm Housing (S-13675, S-14002)
43-156	Tone Arm Support Housing (S-14006, S-14008)
43-157	Tone Arm Support Housing (S-13675, S-14002)
43-164	Record Ejector Housing (S-14006, S-14008)
54-30	No. 8-32 x 5/16" x 7/64" Hex Nut—Steel N.P.
54-66	No. 10-32 x 5/16" Hex Nut—Steel N.P.
54-246	No. 4-40 x 3/16" x 3/32" Hex Nut (S-13675, S-14006)
56-146	Spring Retaining Pin (Pressure Arm)
56-226	Tone Arm Lift Pin—Lower
56-227	Tone Arm Lift Pin—Upper
57-1290	Switch Escutcheon (S-13675)
57-1323	Turntable Shaft Plate
57-1324	Clutch Drive Plate
57-1355	Switch Plate (S-14002, S-14008)
57-1397	Switch Escutcheon (S-14006)
58-133	Phono Plug (S-13675, S-14006, S-14008)
58-169	Phono Plug (S-14002)
63-1744	100 Ohm Carbon Resistor 1/2 W. ±20%—Insulated
63-1779	680 Ohm Carbon Resistor 1/2 W. ±20%—Insulated
63-1954	10 Megohm Carbon Resistor 1/2 W. ±20%—Insulated (S-13675, S-14006, S-14008)
69-38	No. 8-32 x 3/4" R.H.M.S.—Steel N.P.
69-43	No. 8-32 x 3/8" R.H.M.S.—Steel N.P.
69-217	No. 4-40 x 3/16" R.H.M.S. (S-13675, S-14006)
69-238	No. 4-40 x 5/8" R.H.M.S.—Steel Cad.
71-70	No. 6-32 x 3/16" Phillips Flat Hd. M.S.—Steel—Bright N.P.
71-71	No. 6-32 x 1/4" Phillips Flat Hd. M.S.—Steel N.P.
71-81	No. 8-32 x 2 3/4" Flat Hd. M.S.—Steel N.P.
73-99	No. 8-32 x 1/4" Slab Hd. Set Screw—Steel—Conepoint
73-100	No. 8-32 x 1/2" Slab Hd. Set Screw—Steel—Conepoint
80-368	Idler Wheel Tension Spring
80-418	Tension Spring (Pressure Arm)
80-462	Cam Spring
80-479	Spring (Spindle Dog)
80-531	Brake Spring
80-538	Landing Adjustment Spring (S-13902)
80-544	Contact Spring
80-545	Contact Spring
80-572	Clutch Spring (S-13894)
80-574	Pawl Pusher Bracket Spring (S-13903)
80-582	Pawl Spring (S-13901)
80-584	Tone Arm Lift Pin Spring
80-605	Cobra Cartridge Socket Tension Spring (S-13675, S-14006)
80-649	Shut-Off Lever Spring (S-13675, S-14006)
80-650	Shut-Off Pawl Spring
80-653	Trip Arm Spring (S-13903)
83-343	Three Lug Terminal Strip
83-1106	Two Lug Terminal Strip
83-1301	Two Lug Terminal Strip
83-1349	Tone Arm Shipping Strip
83-1423	Cobra Needle Guard Strip
84-65	Tone Arm Rest (S-14006, S-14008)
84-68	Tone Arm Rest (S-13675, S-14002)
85-372	Three Position Slide Switch (S-14002, S-14008)
85-405	On-Off Switch (S-13675, S-14006)
85-406	Auto-Man Switch (S-13675, S-14006)
86-81	Shakeproof Terminal No. 2101-8
86-190	Terminal—Cinch No. 1483
93 125	No. 6 Int. Shakeproof Lockwasher No. 1206
93-126	No. 8 Int. Shakeproof Lockwasher No. 1208
93-216	.015 x .255 x 7/16" Steel Washer—Cad.
93-415	No. 6 Ext. Shakeproof Lockwasher No. 1106
93-536	5/8" x 5/16" x .031 Steel Washer—Cad. Pl.
93-617	Sprocket Shaft Retaining Washer
93-655	.012 x .098 x 9/32" Steel Washer—N.P.
93-672	Idler Wheel Stud Washer—Large
93-673	Idler Wheel Stud Washer—Small
93-677	Idler Wheel Stud Fishpaper Washer—Large
93-678	Idler Wheel Stud Fishpaper Washer—Small
93-679	Idler Wheel Stud Felt Washer
93-719	7/16" x 3/16" x .031 Flat Washer—Cad.
93-764	Spring Washer—Shakeproof No. 3759-14
93-767	Cam Spacer Washer (.020 x .385 x 5/8" Stee —Cad. Pl.)
93-769	Steel Washer—Cad. Pl.
93-844	No. 5 External Shakeproof Lockwasher
93-876	Fibre Washer
93-900	Fibre Washer
93-903	Steel Washer
94-415	Tone Arm Locating Bushing
94-416	Timing Sprocket Bushing
112-56	No. 6 x 1/4" Hex. Hd. Self Tapping Screw—Type Z—Cadmium
112-483	No. 6-32 x 3/8" B.H.M.S.—Steel N.P.
112-576	No. 5-40 x 1/4" Oval B.H.M.S.—Steel N.P.

12-581	No. 6 x 3/8" R.H. Self Tapping Screw—Shakeproof Type 25—Cadmium
12-585	No. 6 x 3/8" R.H. Self Tapping Screw—Type FZ—Cadmium
12-619	Cobra Tone Arm Housing Mounting Screws
12-637	No. 4-40 x 1/4" B.H.M.S.—Steel N.P.
12-706	No. 4-40 x 3/16" R.H.M.S.—Steel N.P. (SEMS)
12-719	No. 6 x 3/8" Flat Hd. Self Tapping Screw—Shakeproof Type 25—Steel Cad. Pl.
14-88	No. 8-32 x 1/2" Hex. Acorn Hd. M.S.—Steel N.P.
14-89	No. 8-32 x 5/16" Hex. Acorn Hd. M.S.—Steel N.P.
14-201	No. 8 x 5/16" Hex. Hd. Slotted Self Tapping Screw—STAN-TAP—Cad. Pl.
14-248	No. 6-20 x 5/16" Hex. Hd. Slotted Self Tapping Screw—Shakeproof Type 25—Steel Cad. Pl.
14-262	No. 8 x 7/16" Hex. Hd. Slotted Self Tapping Screw—STAN-TAP—Cadmium
17-132	Shut-Off Switch Lever (S-13675, S-14006)
25-61	Rubber Grommet—Motor Mtg.
28-21	Record Ejector Cam (S-11668)
41-108	A.C. Phono Motor—60 Cycles
41-109	A.C. Phono Motor—60 Cycles (S-14002)
48-83	Cobra Tone Arm Housing (S-13675, S-14006)
48-51	Bakelite Housing
166-30	Rubber Bumper
166-41	Rubber Bumper
187-9	Push Rod (Automatic Stop S-13675, S-14006)
188-27	Retaining Ring
188-32	Retaining Ring
188-52	Retaining Ring
214-4	Sprocket Drive Chain
S-10732	Idler Assembly
S-11111	Turntable Shaft and Bearing Assembly
S-11118	Idler Wheel Assembly
S-11473	Cobra Needle Cartridge
S-11657	Idler Wheel Stud and Washer Assembly
S-11668	Record Ejector Cam and Shaft Assembly
S-11671	Pressure Arm and Bracket Assembly
S-11672	Record Support Plate Assembly
S-11674	Record Support Plate Mounting Bracket Assembly
S-11675	Discriminator Mtg. Bkt. Assembly (S-14002, S-14006 and S-14008)
S-11683	Selector Sprocket and Bushing Assembly
S-11983	Idler Wheel and Rubber Drive Ring Assembly
S-12038	Record Ejector Housing Cover Assembly (S-14006, S-14008)
S-12507	Record Spindle Assembly
S-12633	Needle Cartridge Socket and Cable Assembly
S-12686	Cam and Washer Assembly
S-12859	Discriminator Knob and Plate Assembly
S-13060	Cobra Tone Arm Hinge Plate and Swivel Bracket Assembly
S-13062	Cobra Tone Arm Hinge Plate, Swivel Bracket, Needle Cartridge Socket and Cable Assembly
S-13063	Cobra Tone Arm Assembly (S-14006, S-14008)
S-13423	Record Support Plate and Bracket Assembly (S-13675)
S-13426	Muting Switch Assembly (S-13675, S-14006, S-14008)
S-13430	Automatic Stop Switch Assembly (S-13675, S-14006).
S-13461	Record Ejector Housing Cover Assembly (S-13675, S-14002)
S-13466	Cobra Tone Arm Assembly (S-13675, S-14002)
S-13494	Record Support Plate Mounting Bracket Assembly (S-13675)
S-13496	Discriminator Mounting Bracket Assembly (S-13675)
S-13497	Bracket and Spring Assembly
S-13872	Trip Plate and Bushing Assembly
S-13894	Clutch Pawl Assembly
S-13895	Drive Sprocket and Bushing Assembly
S-13896	Turntable Drive Shaft Bearing Assembly
S-13900	Timing Sprocket Assembly
S-13901	Trip Switch Assembly
S-13902	Tone Arm Pivot Shaft and Bracket Assembly
S-13903	Clutch Release Arm Assembly
S-13904	Shut-Off Switch Assembly (S-13675, S-14006)
S-13913	Magnet Assembly
S-13915	Cable Assembly (S-13675, S-14006, S-14008)
S-13929	Main Base Plate Assembly (S-13675)
S-13931	Turntable Assembly
S-14229	Cable Assembly (S-14002)
S-14312	Main Base Plate Assembly
S-14313	Muting Switch Assembly (S-14002)
S-14314	Main Base Plate Assembly (S-14008)
S-14581	Trip Lever Mounting Bracket Assembly
S-14582	Trip Lever and Pawl Assembly
S-14665	Main Base Plate Assembly (S-14006)
S-14666	Record Support Plate Mounting Bracket Assembly (S-14006)

Unless Specified, Parts Apply to All Models.

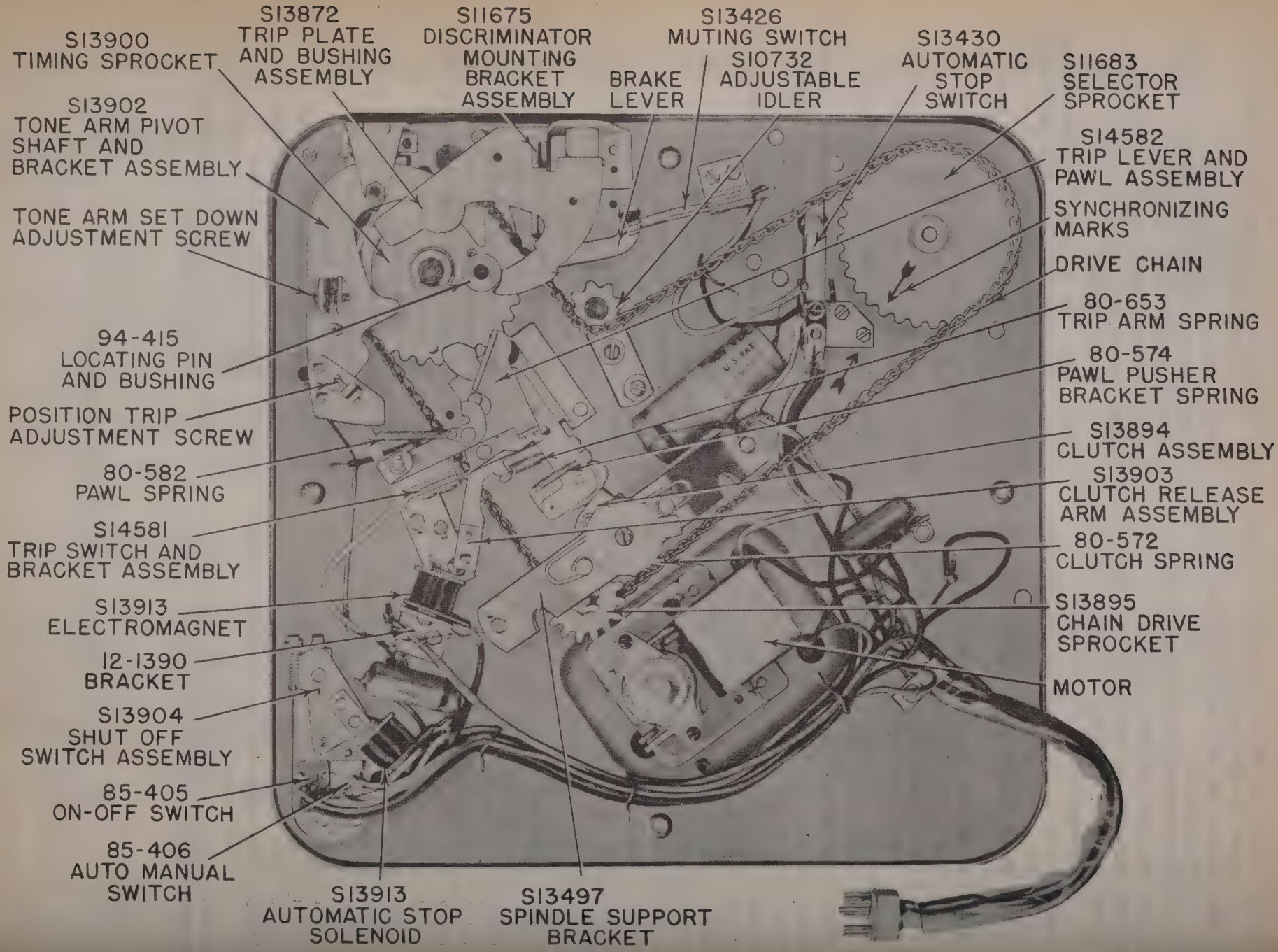
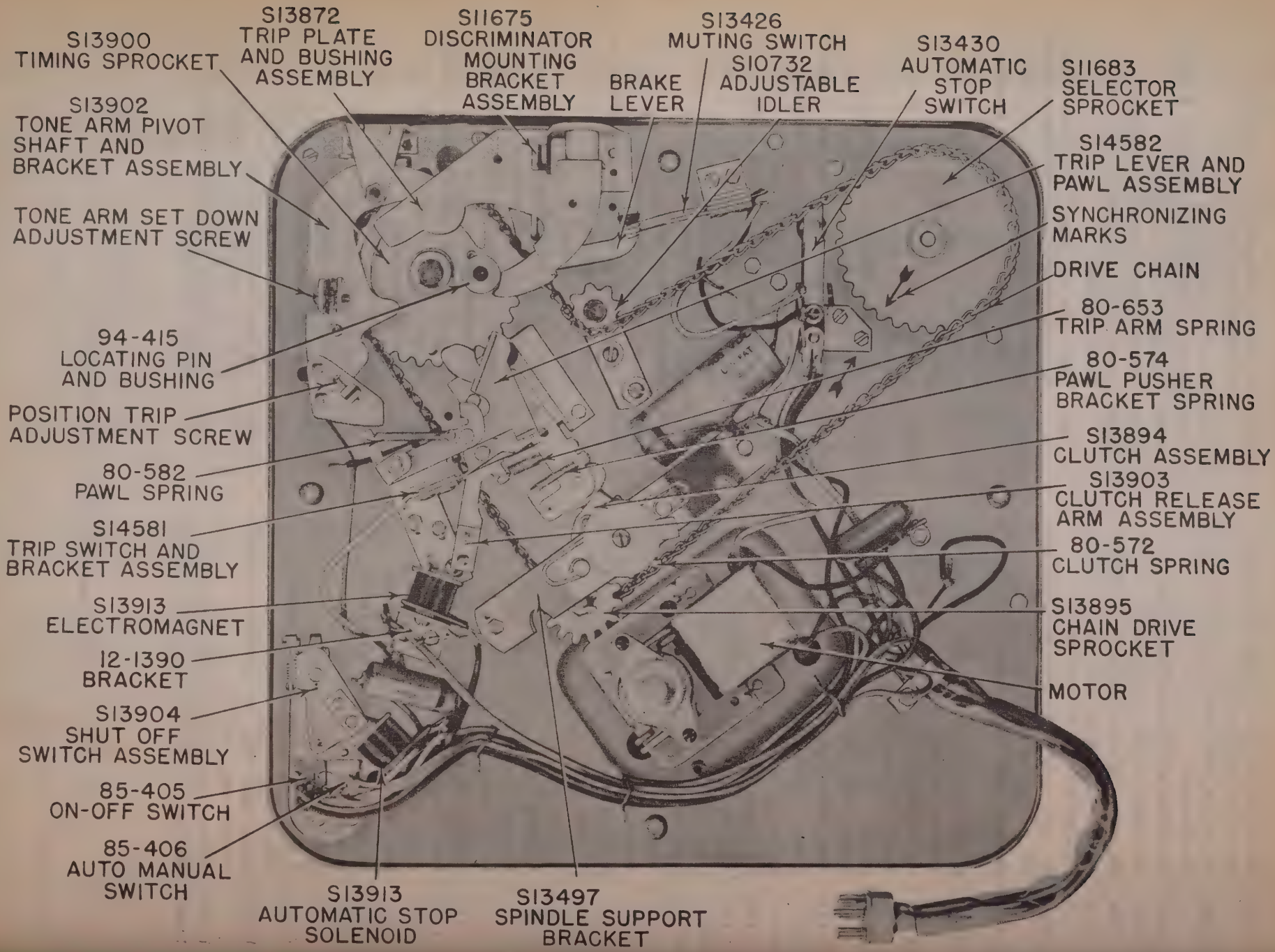
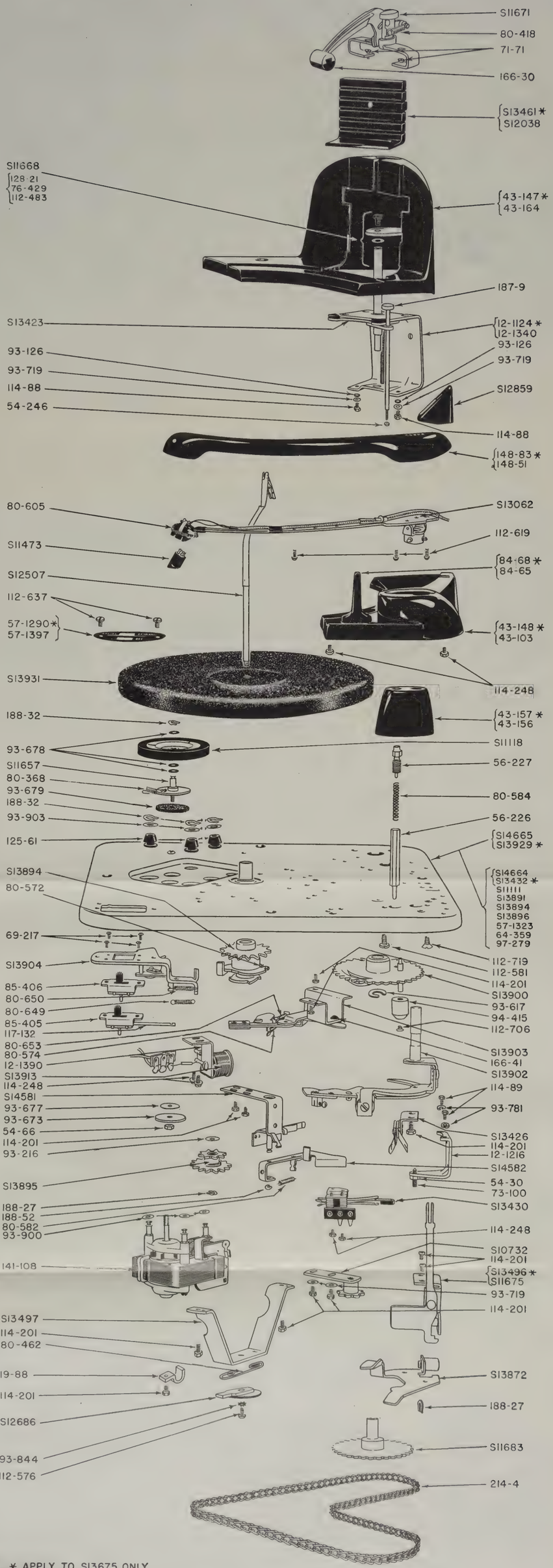


Fig. 20. Bottom View S-13675 and S-14006 Record Changers

on the
rm and
e pres-
AUTO-
change
ill play
the last
set the
on the
of the
AN-OFF
position.

n Z801


S13900
TIMING SPROCKET
S13872
TRIP PLATE
AND BUSHING
ASSEMBLY
S11675
DISCRIMINATOR
MOUNTING
BRACKET
ASSEMBLY
BRAKE
LEVER
S13426
MUTING SWITCH
S10732
ADJUSTABLE
IDLER
S13430
AUTOMATIC
STOP
SWITCH
S11683
SELECTOR
SPROCKET
S13902
TONE ARM PIVOT
SHAFT AND
BRACKET ASSEMBLY
S14582
TRIP LEVER AND
PAWL ASSEMBLY
TONE ARM SET DOWN
ADJUSTMENT SCREW
SYNCHRONIZING
MARKS
DRIVE CHAIN
80-653
TRIP ARM SPRING
94-415
LOCATING PIN
AND BUSHING
80-574
PAWL PUSHER
BRACKET SPRING
POSITION TRIP
ADJUSTMENT SCREW
S13894
CLUTCH ASSEMBLY
80-582
PAWL SPRING
S13903
CLUTCH RELEASE
ARM ASSEMBLY
S14581
TRIP SWITCH AND
BRACKET ASSEMBLY
80-572
CLUTCH SPRING
S13913
ELECTROMAGNET
S13895
CHAIN DRIVE
SPROCKET
12-1390
BRACKET
MOTOR
S13904
SHUT OFF
SWITCH ASSEMBLY
85-405
ON-OFF SWITCH
85-406
AUTO MANUAL
SWITCH
S13913
AUTOMATIC STOP
SOLENOID
S13497
SPINDLE SUPPORT
BRACKET



* APPLY TO S13675 ONLY

Fig. 21. Exploded View of Record Changer.

Copyright 1948 Z.R.C.

Printed in U.S.A.

ZENITH

REG U S PAT. OFF

SERVICE MANUAL

MODELS S14004 AND S14007 AUTOMATIC RECORD CHANGERS

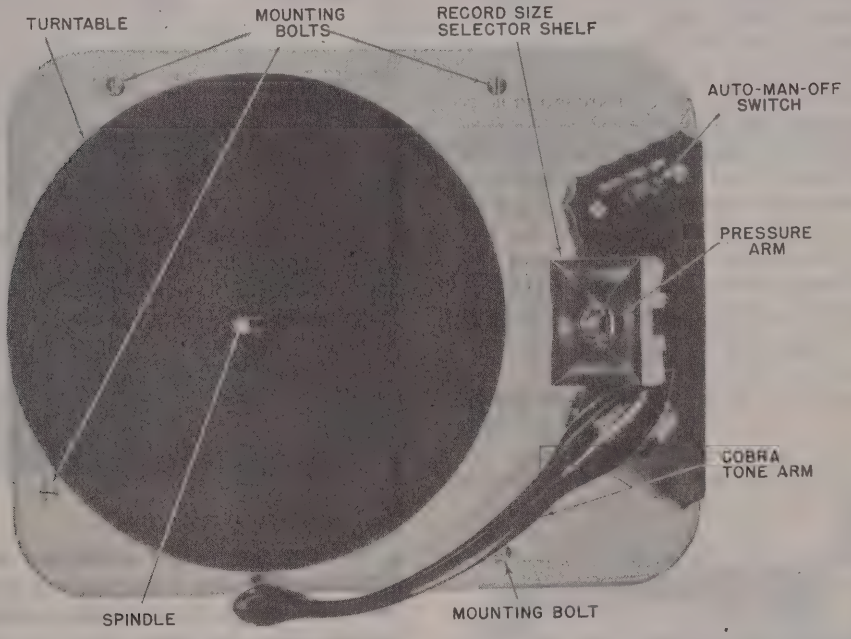


Fig. 1. S14004 and S14007 Record Changers.

GENERAL

The Models S14004 and S14007 record changers are used in Zenith Models 7R887 and 6R880 respectively. These changers are designed to play 12 ten inch or 10 twelve inch records automatically. Odd size and warped records must be played manually. Mechanically the changers are alike. There are slight electrical differences. Model S14004 receives the solenoid energizing voltage from the receiver proper while the S14007 supplies its own energizing voltage from a separate winding on the motor. When servicing these changers, check the schematic diagrams as to the electrical differences. The mechanical operation and adjustments of both changers are identical. To load for automatic operation, set the record size selector shelf to either ten or twelve, depending on the size of the records to be played. Lift the pressure arm and place a stack of records over the spindle. Lower the pressure arm until it rests on the record stack. Set the AUTO-MAN-OFF switch to AUTO and press the record change button on the receiver panel. The record changer will play the complete selection of records, and will repeat the last record until turned off. For manual operation set the AUTO-MAN-OFF switch to MAN, place a record on the turntable and set the needle on the starting groove of the record. To turn the changer off, set the AUTO-MAN-OFF switch to OFF, and place the tone arm in the rest position.

LONG DISTANCE

ZENITH

REG. U.S. PAT. OFF.

INTERNATIONAL RADIO

Form Z801

Copyright 1948 Z.R.C.

Printed in U.S.A.

ZENITH

REG U S PAT OFF

SERVICE MANUAL

MODELS S14004 AND S14007 AUTOMATIC RECORD CHANGERS

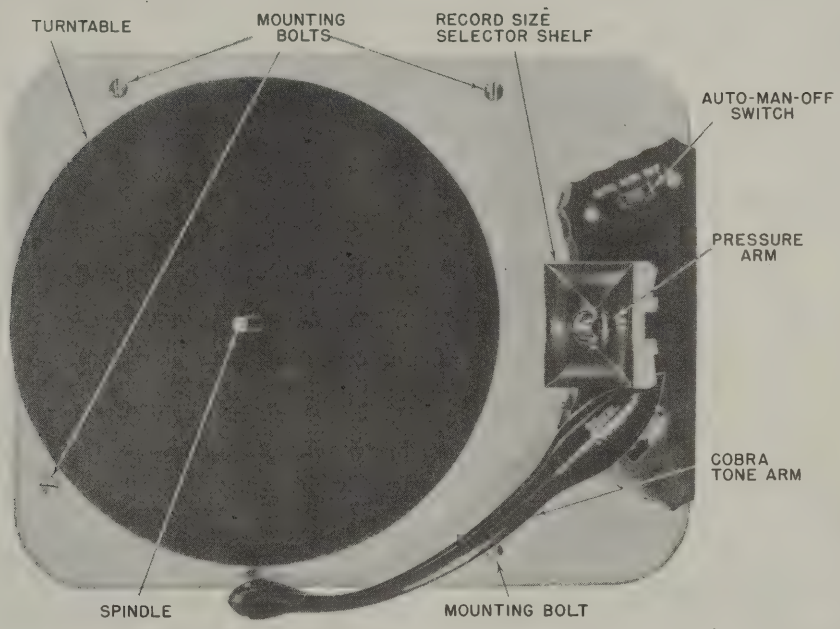


Fig. 1. S14004 and S14007 Record Changers.

GENERAL

The Models S14004 and S14007 record changers are used in Zenith Models 7R887 and 6R880 respectively. These changers are designed to play 12 ten inch or 10 twelve inch records automatically. Odd size and warped records must be played manually. Mechanically the changers are alike. There are slight electrical differences. Model S14004 receives the solenoid energizing voltage from the receiver proper while the S14007 supplies its own energizing voltage from a separate winding on the motor. When servicing these changers, check the schematic diagrams as to the electrical differences. The mechanical operation and adjustments of both changers are identical. To load for automatic operation, set the record size selector shelf to either ten or twelve, depending on the size of the records to be played. Lift the pressure arm and place a stack of records over the spindle. Lower the pressure arm until it rests on the record stack. Set the AUTO-MAN-OFF switch to AUTO and press the record change button on the receiver panel. The record changer will play the complete selection of records, and will repeat the last record until turned off. For manual operation set the AUTO-MAN-OFF switch to MAN, place a record on the turntable and set the needle on the starting groove of the record. To turn the changer off, set the AUTO-MAN-OFF switch to OFF, and place the tone arm in the rest position.

DESCRIPTION OF CYCLING

The motor driven idler wheel rim drives the turntable. Closing the contacts of the trip switch or the record change switch allows current to flow through the solenoid. The magnetic field of the energized solenoid attracts the trip pawl lever which releases the gear pawl tooth and allows it to engage the rotating turntable gear. This action starts the clutch gear to turn. A stud on the clutch gear engages the tone arm lift lever which engages the tone arm stud and raises the tone arm. The tone arm lift lever also applies the tone arm brake which prevents coasting and erratic landing of the needle. The clutch gear moves the tone arm actuating lever and laterally swings the tone arm off the turntable. During the lateral swing of the tone arm, the record ejector link and arm assembly operates the record push plate and when the tone arm moves to its maximum outward position, the record push plate ejects the record and allows it to drop on the turntable. The clutch gear then moves the tone arm actuating lever which swings the tone arm over the starting groove of the record. The tone arm swings 1 inch nearer the spindle with 10 inch records than it does with 12 inch. This difference in inward swing is controlled by the discriminator lever assembly. When the record size selector shelf is turned to the 10 or 12 inch position, its shaft moves the discriminator cam and sets the discriminator lever assembly for the correct inward swing of the tone arm. After the tone arm swings over the starting groove of the record, the tone arm lift lever lowers it and releases the brake. As the clutch gear completes the revolution, the gear pawl tooth bracket hits the trip pawl and the action removes the gear pawl tooth from the path of the turntable gear, causing the clutch gear to stop and complete the cycle.

The velocity trip depends on the ratio of oscillations of the trip switch contact to the rate of movement of the tone arm. As the record is played, the tone arm lever moves slowly inward. The oscillating lever comes in contact with the ratchet on the tone arm lever and then moves out before the ratchet can drag the oscillating lever and close the trip switch contacts. When the record is completed and the needle enters the oscillating groove, the inward speed of the tone arm increases. This makes it impossible for the oscillating lever to move out of the ratchet in time and as a result is dragged inward, closing the trip switch contacts and starting the next cycle.

The S14004 and S14007 record changers use the famous Cobra pickup. Previously published service manuals Z800 and Z801 explain in detail the theory and operation of the Cobra pickup. If these manuals are not available, they may be obtained from your Zenith distributor.

RECORD CHANGER MOUNTING CLIPS

Clamp on pivot clips are used to mount the record changer in the cabinet. The changer is released by applying an upward pressure to the slotted ends of the clips (see Fig. 3) until the clips pivot to a vertical position. When the changer is installed, the clips are pivoted back to the horizontal or holding position.

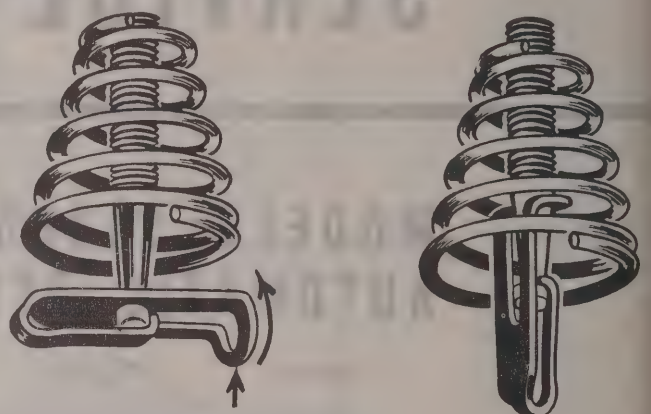


Fig. 3. Record Changer Mounting Clip.

LUBRICATION

Sta-Put grease No. 512 (light grease of the vaseline type) is used for lubrication throughout. Fig. 5 indicates the various lubrication points. Do not apply grease to the top surface or teeth of the clutch gear.

ADJUSTMENTS

TONE ARM HEIGHT ADJUSTMENT

The tone arm height adjustment determines the vertical rise of the tone arm. If the tone arm does not rise sufficiently, the record changer will not play a full load of 12 ten inch records. If, on the other hand, the tone arm is raised too high, it may hit the records on the record shelf. Set the adjustment screw so that the needle clears 12 unwarped ten inch records on the turntable. The tone arm housing must not hit the underside of the records on the record shelf when the changer is cycled after adjustment.

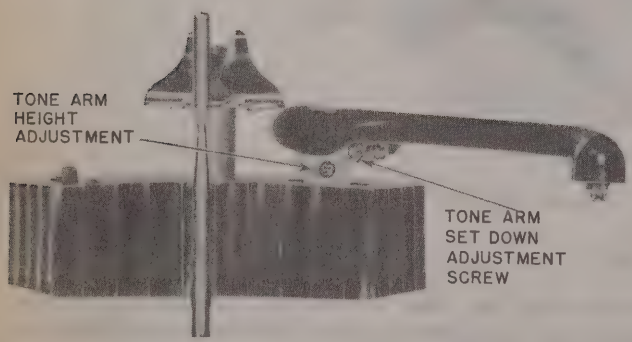


Fig. 2. Tone Arm Set Down and Height Adjustment.

TONE ARM SET DOWN ADJUSTMENT

The landing position of the needle on the record is determined by the setting of the tone arm set down adjustment screw (see Fig. 2). Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

TRIP SWITCH ADJUSTMENT

The tone arm lever must be moved so that its ratchet does not engage the oscillating switch lever. With a pair of long nose pliers simultaneously bend the stationary contact and guide spring until the spacing between the trip switch contacts is 1/16 inch to 3/32 inch. The contact spring must always rest against the heavier guide spring after adjustment.

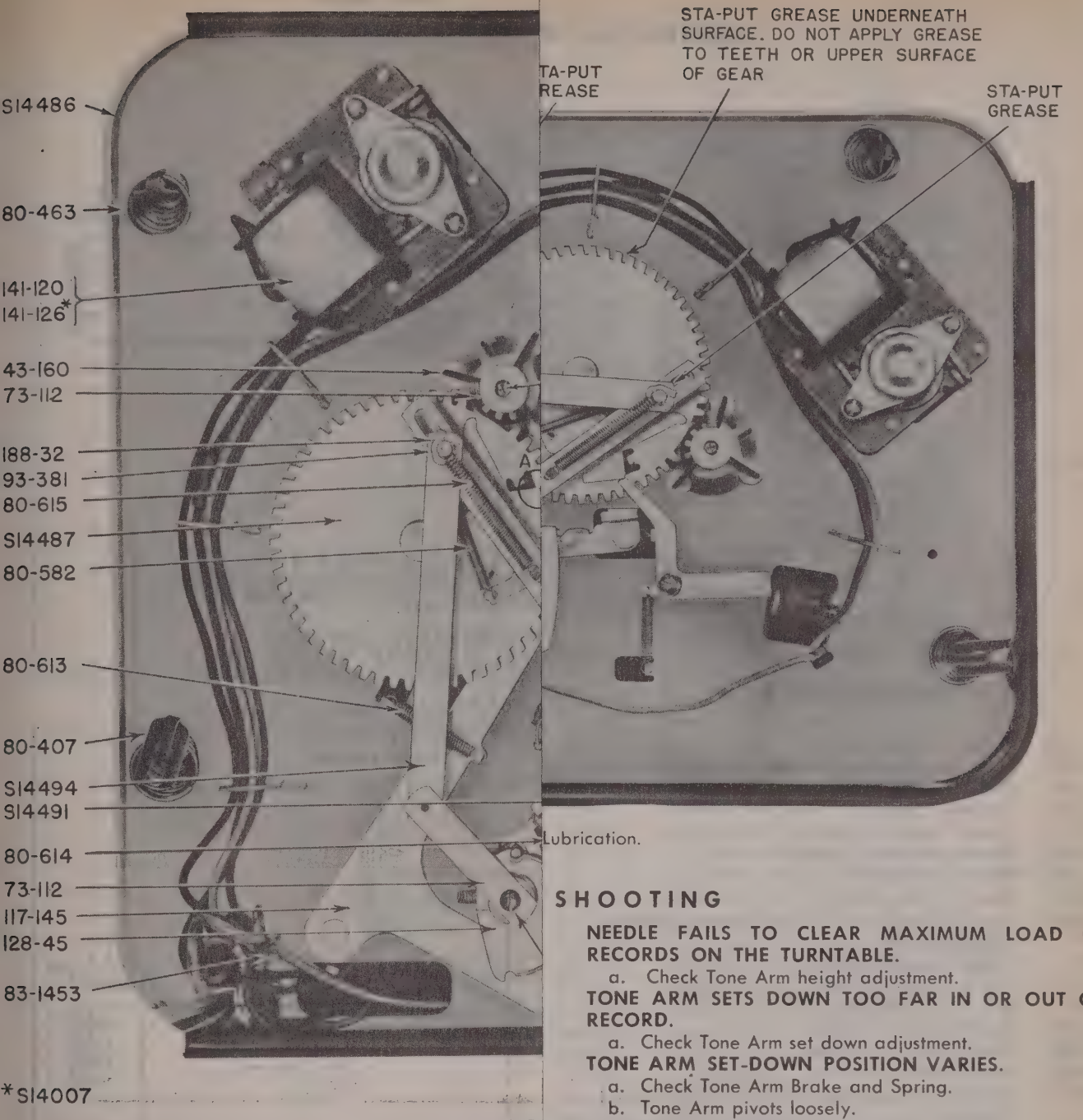


Fig. 4. Bo

Lubrication.

SLAB HEAD SET SCREWS

For maximum rigidity, the spindle, discriminator cam and tone arm lever are locked in position with slab head screws. A slab head set screw wrench is available as Zenith part No. 68-8.

REMOVING THE TONE ARM ASSEMBLY

The complete tone arm assembly can be removed by loosening the two slab head holding screws and pulling the unit out. When the tone arm assembly is installed, the cone points of the slab head screws must enter the indentations previously made. A new assembly does not have these indentations, and must be assembled as follows:

1. See that the changer mechanism is out of cycle.
2. Turn the tone arm set down adjustment screw (see Fig. 2) as far as it will go in the clockwise direction.

SHOOTING

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

a. Check Tone Arm height adjustment.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

a. Check Tone Arm set down adjustment.

TONE ARM SET-DOWN POSITION VARIES.

a. Check Tone Arm Brake and Spring.
b. Tone Arm pivots loosely.

CHANGER CONTINUES TO CYCLE.

a. Check the trip switch adjustment.
b. Check Record Change switch.
c. Trip Pawl sticks.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

a. See that the AUTO-MAN-OFF switch is set to AUTO.
b. Be certain that the record has an eccentric center groove.
c. Check the Trip Switch.
d. Check the solenoid energizing voltage.

SOLENOID FAILS TO TRIP MECHANISM

a. Check the pawl lever positioning stud. The tip of the pawl must be in approximately the same position in relation to the gear pawl tooth lever as indicated at "A" in Fig. 4. If the position is not the same as indicated, the positioning stud can be bent slightly.
b. Tension on the trip pawl actuating spring too high.

MECHANISM JAMS

a. Burr or sharp point on the gear pawl tooth. Smooth out with a small file.

DESCRIPTION OF CYCLING

The motor driven idler wheel rim drives the turntable. Closing the contacts of the trip switch or the record change switch allows current to flow through the solenoid. The magnetic field of the energized solenoid attracts the trip pawl lever which releases the gear pawl tooth and allows it to engage the rotating turntable gear. This action starts the clutch gear to turn. A stud on the clutch gear engages the tone arm lift lever which engages the tone arm stud and raises the tone arm. The tone arm lift lever also applies the tone arm brake which prevents coasting and erratic landing of the needle. The clutch gear moves the tone arm actuating lever and laterally swings the tone arm off the turntable. During the lateral swing of the tone arm, the record ejector link and arm assembly operates the record push plate and when the tone arm moves to its maximum outward position, the record push plate ejects the record and allows it to drop on the turntable. The clutch gear then moves the tone arm actuating lever which swings the tone arm over the starting groove of the record. The tone arm swings 1 inch nearer the spindle with 10 inch records than it does with 12 inch. This difference in inward swing is controlled by the discriminator lever assembly. When the record size selector shelf is turned to the 10 or 12 inch position, its shaft moves the discriminator cam and sets the discriminator lever assembly for the correct inward swing of the tone arm. After the tone arm swings over the starting groove of the record, the tone arm lift lever lowers it and releases the brake. As the clutch gear completes the revolution, the gear pawl tooth bracket hits the trip pawl and the action removes the gear pawl tooth from the path of the turntable gear, causing the clutch gear to stop and complete the cycle.

The velocity trip depends on the ratio of oscillations of the trip switch contact to the rate of movement of the tone arm. As the record is played, the tone arm lever moves slowly inward. The oscillating lever comes in contact with the ratchet on the tone arm lever and then moves out before the ratchet can drag the oscillating lever and close the trip switch contacts. When the record is completed and the needle enters the oscillating groove, the inward speed of the tone arm increases. This makes it impossible for the oscillating lever to move out of the ratchet in time and as a result is dragged inward, closing the trip switch contacts and starting the next cycle.

The S14004 and S14007 record changers use the famous Cobra pickup. Previously published service manuals Z800 and Z801 explain in detail the theory and operation of the Cobra pickup. If these manuals are not available, they may be obtained from your Zenith distributor.

RECORD CHANGER MOUNTING CLIPS

Clamp on pivot clips are used to mount the record changer in the cabinet. The changer is released by applying an upward pressure to the slotted ends of the clips (see Fig. 3) until the clips pivot to a vertical position. When the changer is installed, the clips are pivoted back to the horizontal or holding position.

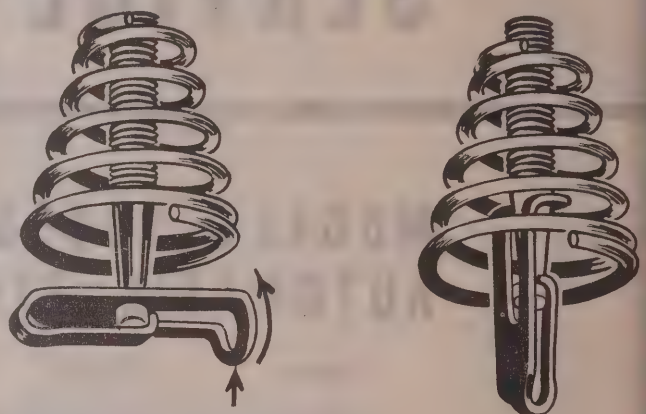


Fig. 3. Record Changer Mounting Clip.

LUBRICATION

Sta-Put grease No. 512 (light grease of the vaseline type) is used for lubrication throughout. Fig. 5 indicates the various lubrication points. Do not apply grease to the top surface or teeth of the clutch gear.

ADJUSTMENTS

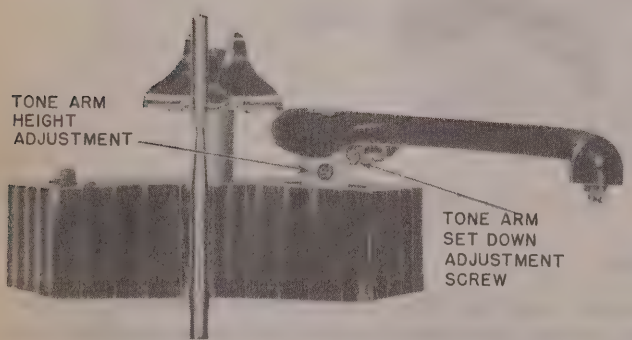


Fig. 2. Tone Arm Set Down and Height Adjustment.

TONE ARM SET DOWN ADJUSTMENT

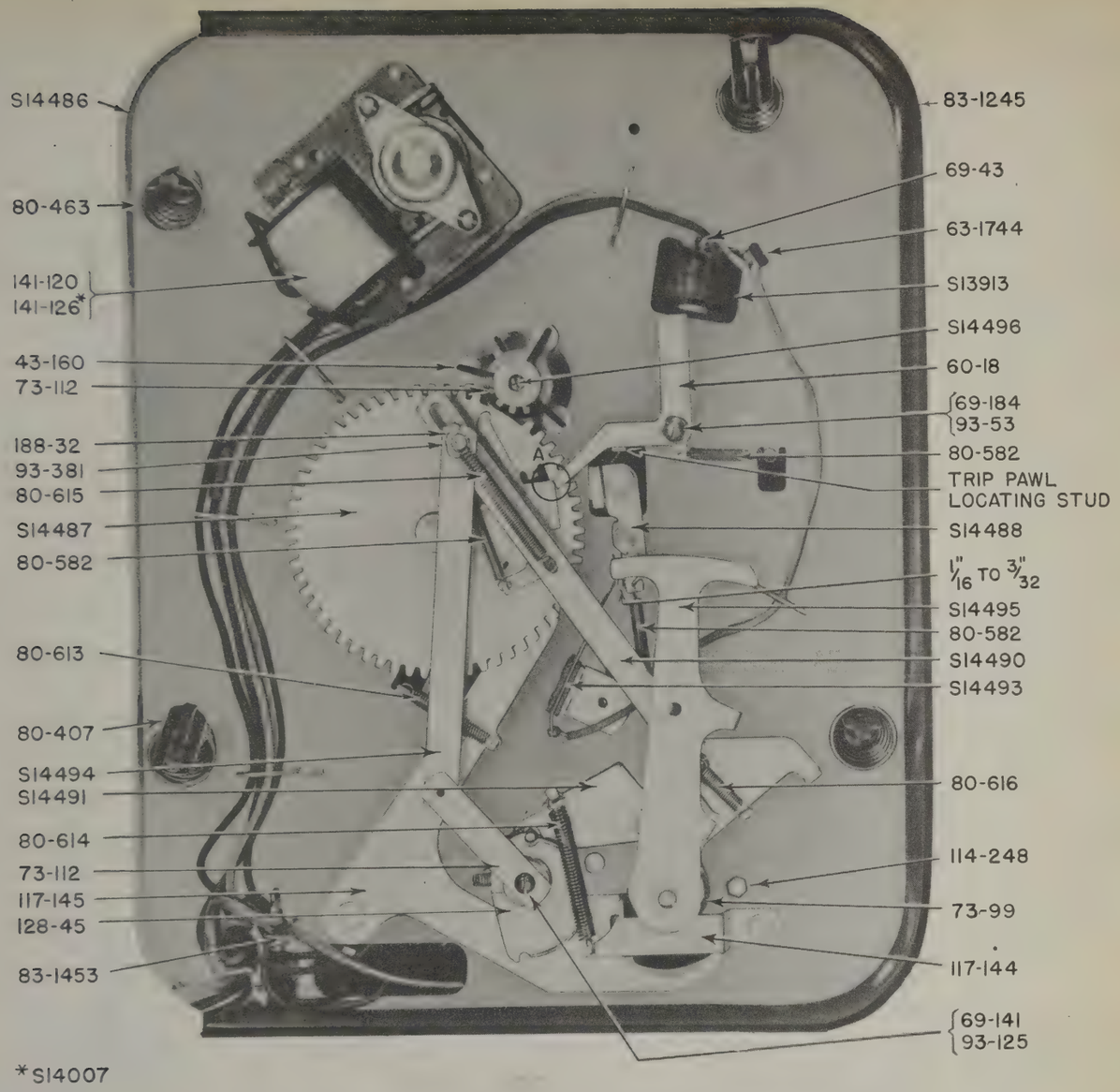
The landing position of the needle on the record is determined by the setting of the tone arm set down adjustment screw (see Fig. 2). Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

TONE ARM HEIGHT ADJUSTMENT

The tone arm height adjustment determines the vertical rise of the tone arm. If the tone arm does not rise sufficiently, the record changer will not play a full load of 12 ten inch records. If, on the other hand, the tone arm is raised too high, it may hit the records on the record shelf. Set the adjustment screw so that the needle clears 12 unwarped ten inch records on the turntable. The tone arm housing must not hit the underside of the records on the record shelf when the changer is cycled after adjustment.

TRIP SWITCH ADJUSTMENT

The tone arm lever must be moved so that its ratchet does not engage the oscillating switch lever. With a pair of long nose pliers simultaneously bend the stationary contact and guide spring until the spacing between the trip switch contacts is 1/16 inch to 3/32 inch. The contact spring must always rest against the heavier guide spring after adjustment.



*S14007

Fig. 4. Bottom View.

SLAB HEAD SET SCREWS

For maximum rigidity, the spindle, discriminator cam and tone arm lever are locked in position with slab head screws. A slab head set screw wrench is available as Zenith part No. 68-8.

REMOVING THE TONE ARM ASSEMBLY

The complete tone arm assembly can be removed by loosening the two slab head holding screws and pulling the unit out. When the tone arm assembly is installed, the cone points of the slab head screws must enter the indentations previously made. A new assembly does not have these indentations, and must be assembled as follows:

1. See that the changer mechanism is out of cycle.
2. Turn the tone arm set down adjustment screw (see Fig. 2) as far as it will go in the clockwise direction.
3. Insert the tone arm support shaft through its mounting hole.
4. Place a 12 inch record on the turntable and hold the Cobra tone arm housing against the edge of the record. Move the tone arm lever (Part No. S14495) to its maximum outward position. These two positions must be maintained during the next operation.
5. See that the tone arm lever bushing has approximately .005 inch play and tighten the slab head screws.
6. Adjust the tone arm set down adjustment screw (see Fig. 2) for proper landing of the needle.

REMOVING THE RECORD SHELF

The record shelf is removed by unscrewing the slab head screw at the bottom of its shaft and the machine screw which holds the record ejector link. When the unit is assembled, see that the changer is out of cycle and turn the slotted shaft until the record push off plate is retracted into its housing before attaching the record ejector link.

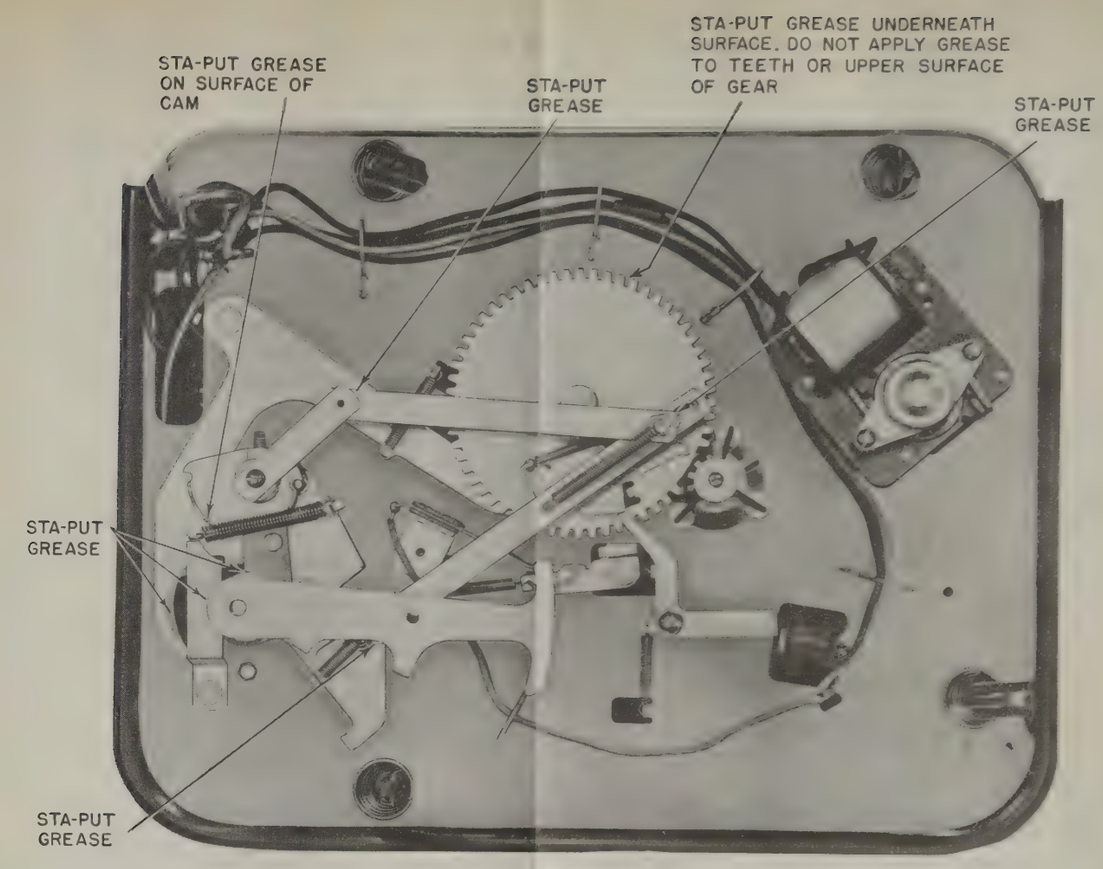

STA-PUT GREASE ON SURFACE OF CAM
STA-PUT GREASE
STA-PUT GREASE UNDERNEATH SURFACE. DO NOT APPLY GREASE TO TEETH OR UPPER SURFACE OF GEAR
STA-PUT GREASE
STA-PUT GREASE
STA-PUT GREASE

Fig. 5. Lubrication.

TROUBLE SHOOTING

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

a. Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.
b. Check lubrication.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

a. See that the Phono Radio switch is on Phono.
b. Check receiver audio by listening to radio.
c. Check the phono oscillator tube.
d. Check Needle Cartridge.
e. Check Tone Arm Housing for broken leads.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START RECORD CHANGE CYCLE.

a. See that the AUTO-MAN-OFF switch is set to AUTO.
b. Check Record Change Switch.
c. Check electrical continuity of solenoid circuit.
d. Check the solenoid energizing voltage.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

a. Changer not "floated" properly. Remove packing strip. Loosen mounting bolts.
b. Motor retaining rings rubbing on the idler wheel.
c. Motor leads pulled too tight preventing motor from "floating" freely.
d. Noisy phono oscillator tube.
e. Impression on Idler Wheel.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

a. Check Tone Arm height adjustment.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

a. Check Tone Arm set down adjustment.

TONE ARM SET-DOWN POSITION VARIES.

a. Check Tone Arm Brake and Spring.
b. Tone Arm pivots loosely.

CHANGER CONTINUES TO CYCLE.

a. Check the trip switch adjustment.
b. Check Record Change switch.
c. Trip Pawl sticks.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

a. See that the AUTO-MAN-OFF switch is set to AUTO.
b. Be certain that the record has an eccentric center groove.
c. Check the Trip Switch.
d. Check the solenoid energizing voltage.

SOLENOID FAILS TO TRIP MECHANISM

a. Check the pawl lever positioning stud. The tip of the pawl must be in approximately the same position in relation to the gear pawl tooth lever as indicated at "A" in Fig. 4. If the position is not the same as indicated, the positioning stud can be bent slightly.
b. Tension on the trip pawl actuating spring too high.

MECHANISM JAMS

a. Burr or sharp point on the gear pawl tooth. Smooth out with a small file.

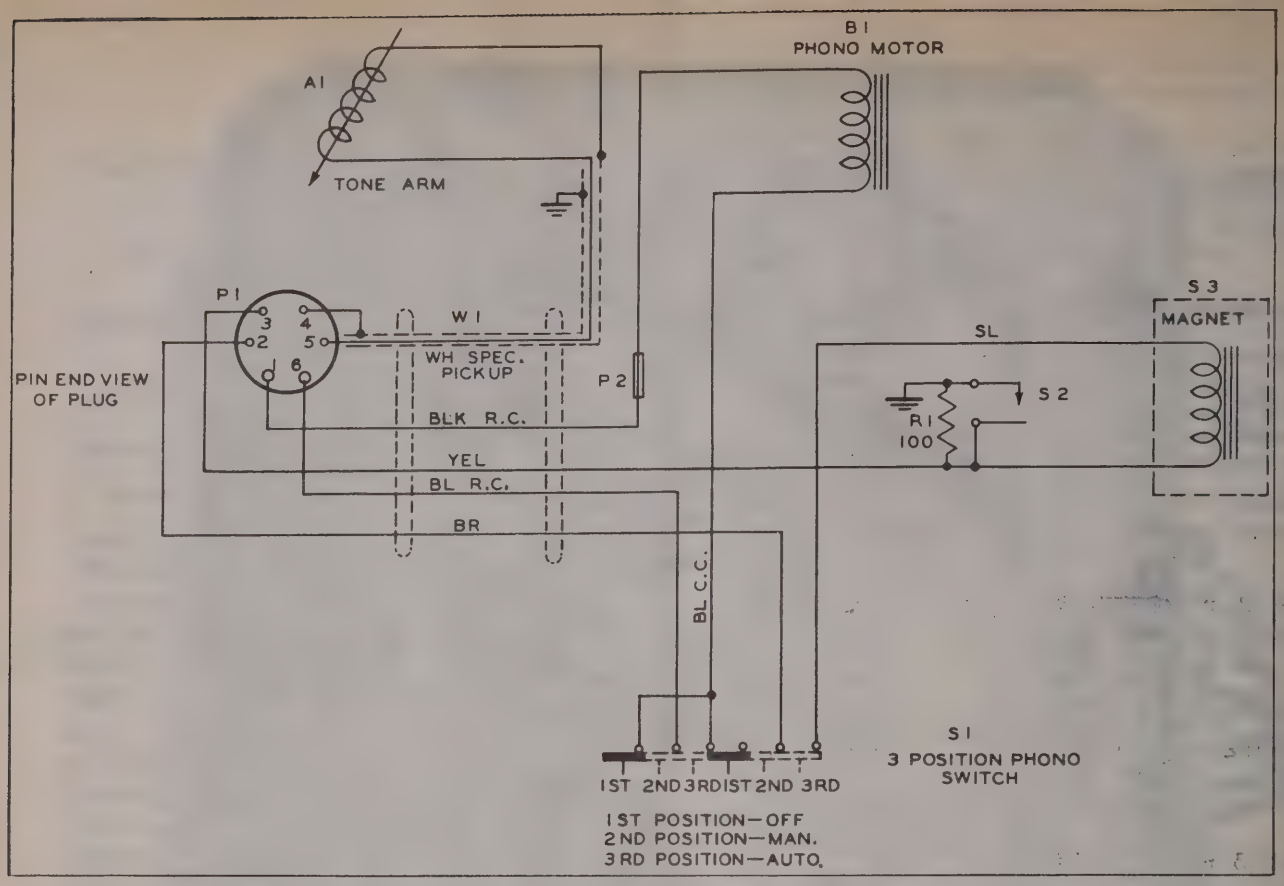


Fig. 7. Schematic Diagram S14004 Record Changer.

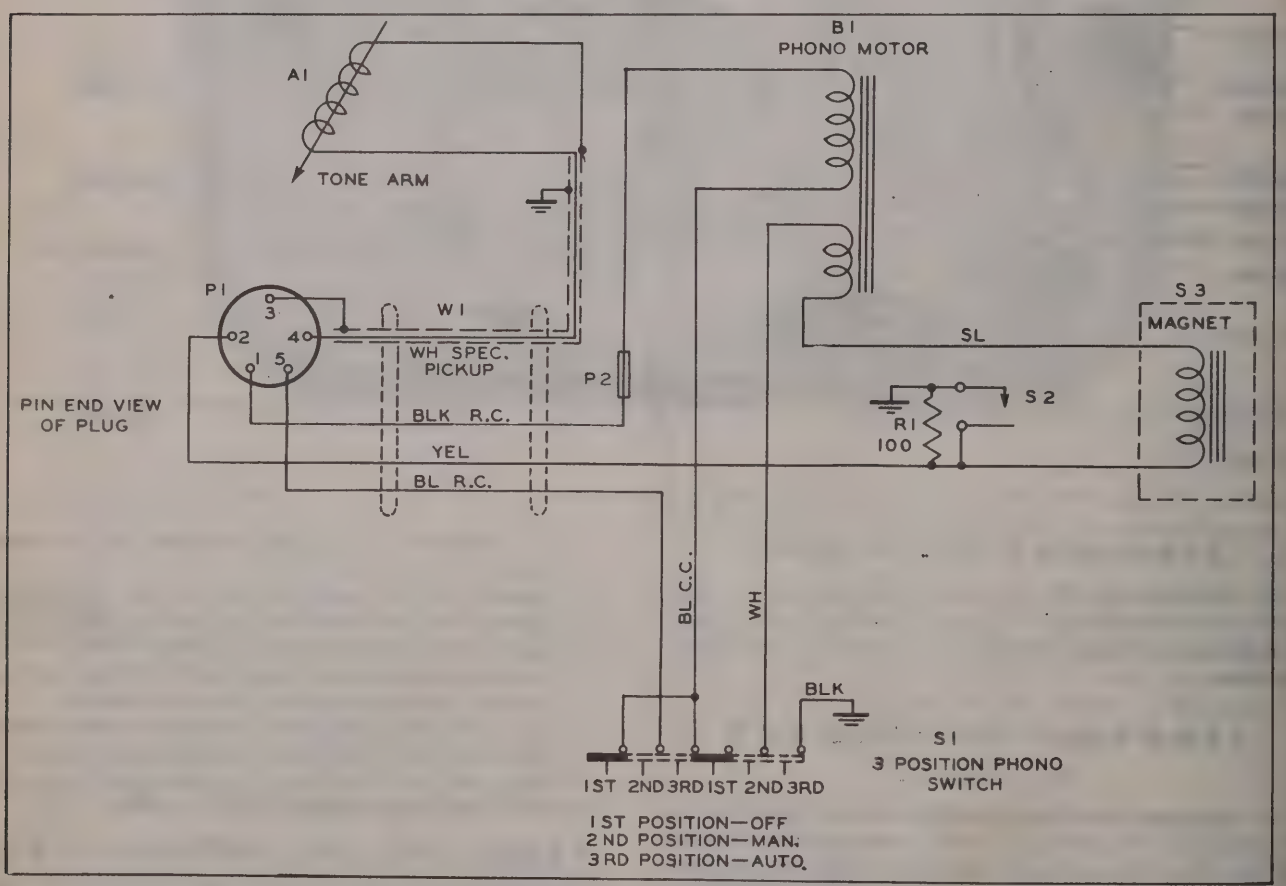


Fig. 8. Schematic Diagram S14007 Record Changer.

ZENITH

REG U.S. PAT OFF.

LONG DISTANCE RADIO

REG U.S. PAT OFF.

HOUSEHOLD RECEIVER SERVICE BULLETIN

NUMBER 1

CHASSIS NO. 5C01, 6C01, 6C05, 6C40, 8C01, 8C05, 8C20, 8C21, 11C21, 11C21Z

ZENITH RADIO CORPORATION

CHICAGO, U. S. A.

Printed in U.S.A.

NUMERICAL PARTS LIST

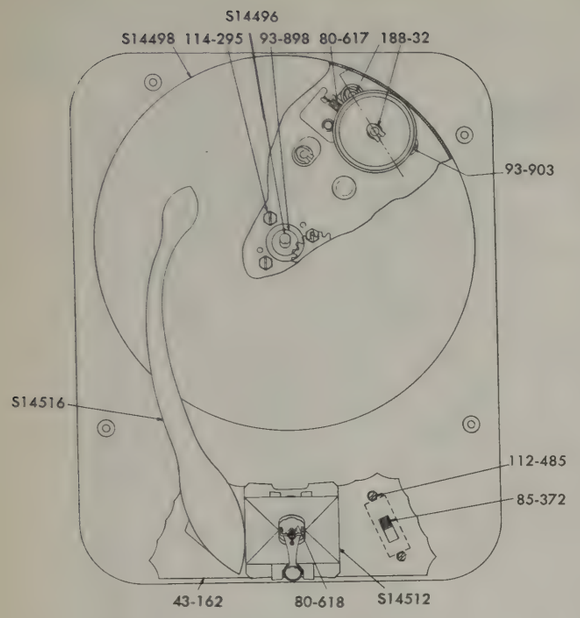


Fig. 6. Parts Identification, Top View.

12-1444	Socket Mounting Bracket
12-1477	Tone Arm Mounting Bracket (Upper)
56-144	Socket Retaining Pin
78-561	Cartridge Socket
80-605	Socket Tension Spring
80-609	Landing Adjusting Spring
83-1121	Felt Strip (Bumper)
93-899	Steel Washer—N.P.
112-619	No. 2-32 x 5/16 in. R.H. Self Tapping Screw—Steel—Cad. Pl.
17-81	Cable Clamp (S14004)
17-88	Cable Clamp (S14007)
23-22	A.C. Wire Connector
24-458	Switch Cover (S14007)
43-160	Turntable Gear Housing
43-162	Record Ejector Housing
56-239	Groove Pin Type No. 4 (3/32 in. D X 3/8 in. lg.) (S14004)
56-240	Groove Pin Type No. 2 (1/16 in. D X 1/4 in. lg.) (S14004)
58-166	6 Prong Plug (S14004)
60-18	Trip Pawl
61-125	Idler Wheel
63-1744	Resistor
69-43	No. 8-32 x 3/8 in. R.H.M.S.—Steel N.P.
69-141	No. 5-40 x 1/4 in. R.H.M.S.—Steel N.P.
69-184	No. 8-32 x 1/4 in. R.H.M.S.—Steel—Cad.
69-262	No. 8-32 x 1/2 in. Phillips R.H.M.S.—Steel
73-99	No. 8-32 x 1/4 in. Slab Hd. Set Screw—Cone-point (2 used)
73-112	No. 8-32 x 1/2 in. Slab Hd. Set Screw—Cup-point (2 used)
80-582	Pawl Spring (3 used)
80-610	Switch Contact Spring
80-613	Lift Pin Lever Spring
80-614	Brake Spring
80-615	Tone Arm Link Spring (Long)
80-616	Tone Arm Link Spring (Short)
80-617	Idler Wheel Spring
80-618	Pressure Arm Spring
80-619	Tone Arm Swivel Spring
80-645	Tone Arm Height Adjusting Spring
85-372	Three Position Slide Switch
93-53	1/64 x 1 1/64 in. x 3/8 in. Steel Washer—N.P.
93-125	No. 6 Int. Lockwasher
93-381	1/32 in. x 7/32 in. x 3/8 in. Steel Washer—Cad.
93-678	Idler Wheel Stud Fishpaper Washer—Small
93-781	No. 8 Split Lockwasher—Steel N.P.
93-876	Fibre Washer
93-898	Steel Washer
93-900	Fibre Washer (3 used)
93-903	Steel Washer—Copper Flash (3 used)
93-927	Idler Wheel Stud Washer—Large
93-928	Idler Wheel Stud Washer—Small
93-929	Idler Wheel Stud Fishpaper Washer—Large
93-930	Idler Wheel Stud Felt Washer
94-620	Stop Bushing
97-298	Trip Pawl Stud
97-301	Clutch Gear Retaining Stud
112-485	No. 4-40 x 1/4 in. B.H.M.S.—Steel—Black Zinc Plate (2 used)
114-248	No. 6-20 x 5/32 in. Hex. Hd. Slotted S.T. Screw—Steel—Cad. (4 used)
114-295	No. 8-32 x 5/16 in. Hex. Hd. Slotted S.T. Screw—Steel—Cad. (4 used)
117-144	Brake Lever
117-145	Tone Arm Lift Lever
125-61	Rubber Grommet (3 used)
125-65	Pressure Arm Grommet
128-45	Discriminator Cam
141-120	A.C. Phono Motor—110 V. 60 cycle (S14004)
141-126	A.C. Phono Motor—110 V. 60 Cycle (S14007)
148-83	Tone Arm Housing only
S11473	Cobra Cartridge and Needle Assembly
S14516	Cobra Tone Arm Assembly—complete
S14673	Hinge Plate Socket and Stop Assembly
S14674	Hinge Plate Assembly—complete
S14675	Shielded Wire Cable
148-96	Record Ejector Arm
148-97	Record Pressure Arm
149-60	Magnet Core
188-32	Retaining Ring (5 used)
199-85	Tone Arm Sleeve
S13913	Magnet Coil Assembly (Solenoid)
S14487	Clutch Gear Assembly
S14488	Oscillating Lever and Gear Assembly
S14490	Tone Arm Actuating Lever Assembly
S14491	Discriminator Lever Assembly
S14493	Trip Switch Assembly
S14494	Record Ejector Link and Arm Assembly
S14495	Tone Arm Lever Assembly
S14496	Record Spindle Assembly
S14498	Turntable Assembly (Flock Finish)
S14499	Ejector Cam Shaft Assembly
S14510	Record Support Plate and Post Assembly
S14512	Pressure Arm and Mounting Assembly
S14513	Tone Arm Shaft Assembly
S14514	Tone Arm Bracket and Lift Pin Assembly
S14515	Cable and Plug Assembly (S14004)
S14682	Idler Wheel Stud and Washer Assembly
S14691	Cable and Plug Assembly (S14007)

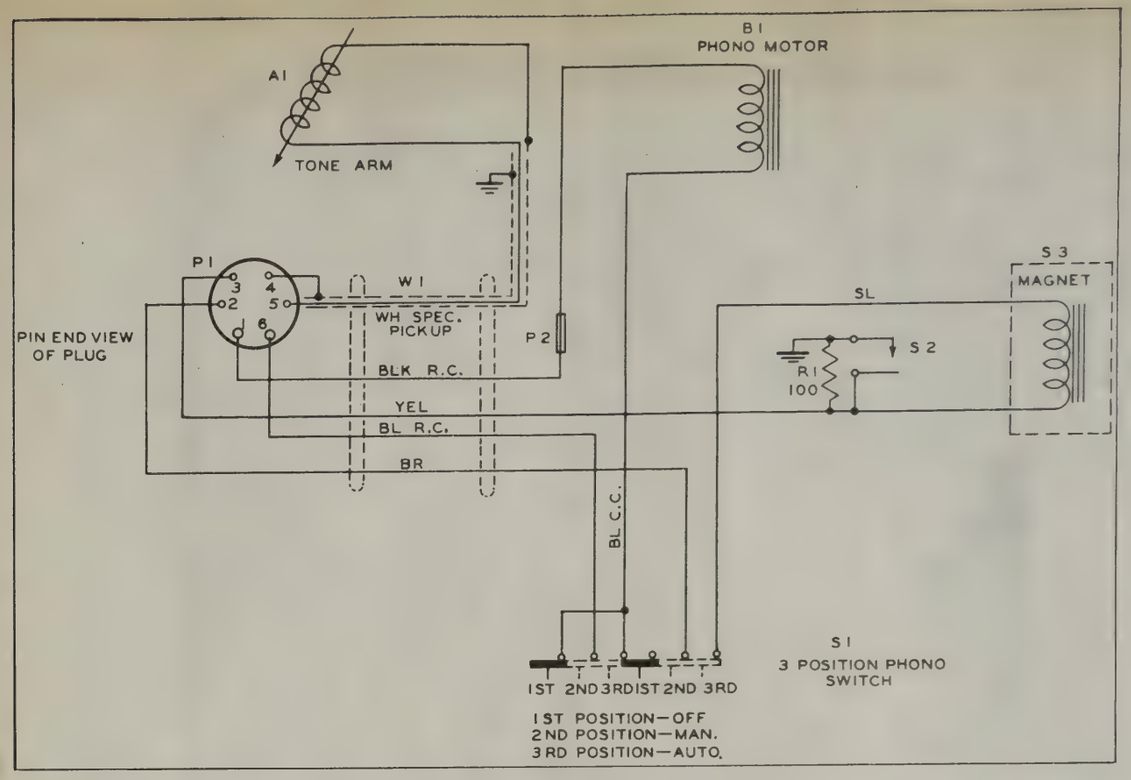


Fig. 7. Schematic Diagram S14004 Record Changer.

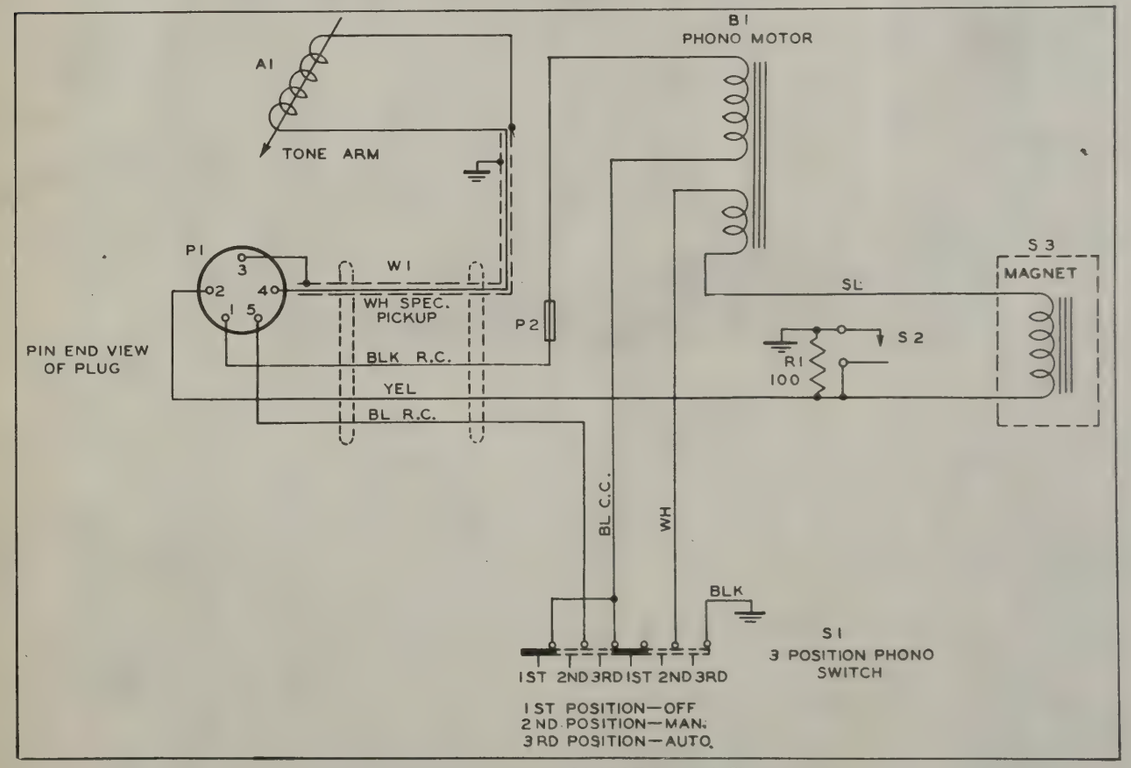


Fig. 8. Schematic Diagram S14007 Record Changer.

Form Z802

ZENITH RADIO CORPORATION
6001 Dickens Ave., Chicago 39, Ill.

Printed in U.S.A.

ZENITH
REG U S PAT OFF
•LONG DISTANCE• RADIO
REG U S PAT OFF

HOUSEHOLD RECEIVER SERVICE BULLETIN
NUMBER 1

CHASSIS NO. 5C01, 6C01, 6C05, 6C40, 8C01, 8C05, 8C20, 8C21, 11C21, 11C21Z

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

Printed in U.S.A.

IMPROVING FM RECEPTION ON 8HO AND 9HO SERIES

In FM Consoles, a cabinet FM antenna may be added in addition to the line antenna. This antenna i made up of two 28 inch lengths of wire. One wire is connected to the FM antenna post, the other t chassis. The two wires are then tacked in the cabinet in opposite directions, and should not com in contact with ground.

WAVE TRAP TRIMMER SHORTING OUT

A .002 MFD volt capacitor in series with the grounded side of the wave trap will remove the D.C. potential from the trap. This will eliminate the possibility of a breakdown.

AUDIO HOWL AS VOLUME CONTROL IS ADVANCED (FM RECEPTION)

FM howl may be caused by the speaker vibrating the oscillator slug. A fiber spacer between the os- cillator, and detector slug shafts in the FM tuner will eliminate vibration. A thin rubber ban tied to the center of the oscillator slug shaft and upper frame will also eliminate the howl.

HOWL ON AM 8HO SERIES

Howl due to vibrations transmitted into the oscillator sections of the gang condenser by the speaker. To remedy this condition, a felt strip can be placed between the rear of the gang, and the first I transformer. It may also be necessary to move the oscillator section lead underneath the gan slightly to reduce tension.

STRIPPED IF SLUG INSERTS

Damaged IF slug thread inserts may be replaced by unscrewing the slug and pushing out the old in- sert.

Two types of inserts are used, 83-1063 short and 83-1069 long.

CHASSIS 8C40 MODEL 8G005

MICROPHONICS

Howl caused by a microphonic 1LD5 tube. These tubes have been improved, and all tubes after F6E (June '46) are non-microphonic and should replace the older type.

CHASSIS 11C21-11C21Z-12HO SERIES

DIFFERENCES IN 11C21-11C21Z CHASSIS

Sets using chassis 11C21Z are equipped with PM speakers. PM speakers cannot be used on 11C21 chas- sis. When ordering speaker replacements specify 11C21 or 11C21Z chassis.

IMPROVING FM RECEPTION

In FM Consoles a cabinet FM antenna may be added in addition to the line antenna. This antenna is made up of two 28 inch lengths of wire. One wire is connected to the FM antenna post, the other to chassis. The two wires are then tacked in the cabinet in opposite directions, and should not come in contact with ground.

HOWL ON FM

FM howl may be caused by the speaker vibrating the oscillator slug. A fiber spacer between the os- cillator, and detector slug shafts in the FM tuner will eliminate vibration. A thin rubber band tied to the center of the oscillator slug shaft and upper frame will also eliminate the howl.

INCREASING BASS RESPONSE ON PHONO

To increase the bass response on records the value of R 5 in the phono-pre-amplifier may be in- creased. Do not increase the value to over 10,000 ohms or audio howl may be heard.

STRIPPED IF THREAD INSERTS

Damaged IF slug thread inserts may be replaced by unscrewing the slug, and pushing out the old in- sert. Two types of inserts are used, 83-1063 short, and 83-1069 long.

WAVE TRAP TRIMMER SHORTS OUT

A .002 MFD volt capacitor in series with the grounded side of the wave trap will remove the D.C. potential from the trap. This will eliminate the possibility of a breakdown.

HUM COMPLAINT

Check for excessive length of the AC line cord inside the main chassis between the point of entrance and the solder lugs. This slack may be in close proximity of the tone control leads.

CHASSIS 5C01-6C01-6C05

DISTORTION AND POOR SENSITIVITY

Distortion and poor sensitivity usually caused by a short between turns on the wavemagnet.

Poor sensitivity and set fails to operate on low frequency end of dial - replace oscillator coil.

UNCONTROLLED OSCILLATION

A 470,000 ohm carbon resistor soldered across the secondary of the first IF transformer will correct this condition.

CHASSIS 6C40 MODEL 6G001

BLOCKING

The A.C. plug being inserted in the battery saver switch socket while the on-off switch is on may cause the set to block and become dead. Switching the set off and on will relieve this blocked condition and return the set to normal operation.

CHASSIS 8C01 ACDC
MODEL 8H023-34

MODULATION HUM

Under humid conditions, the insulating material inside the power socket riveted to the back cover would absorb moisture. If the solder lug is in contact with this material some of the AC voltage would leak into the back cover. Since this back cover is next to the loop, hum modulation would be evident.

To remedy this condition, remove the back from the receiver, and open the AC connector, and bend the solder lug away from the insulating wall. A vinylite sleeve over the solder lugs will insure good insulation.

HUM COMES UP AS VOLUME CONTROL IS ADVANCED

Hum in the 8C01 chassis may be caused by an open .05-200V condenser which is connected between the metal shell of the volume control and chassis.

AUDIO HOWL ON FM

1. 83-1328 plastic spacer installed between the centers of the oscillator and detector slug shafts. This prevents the slugs from vibrating.
2. Float speaker on rubber grommets.
3. 166-36 felt cushion placed between the back of the gang and IF transformer.
4. To improve floating of the gang, remove the support screw nearest the dial.

CHASSIS 8C20-8C21-8H0-9H0 SERIES

BUZZ IN DIAL ESCUTHEON 8H0 AND 9H0 SERIES

If the dial assembly comes in contact with the power transformer a buzz will result and a 83-1331 felt spacer should be added between the dial and transformer.

INCREASING BASS RESPONSE OF PHONO

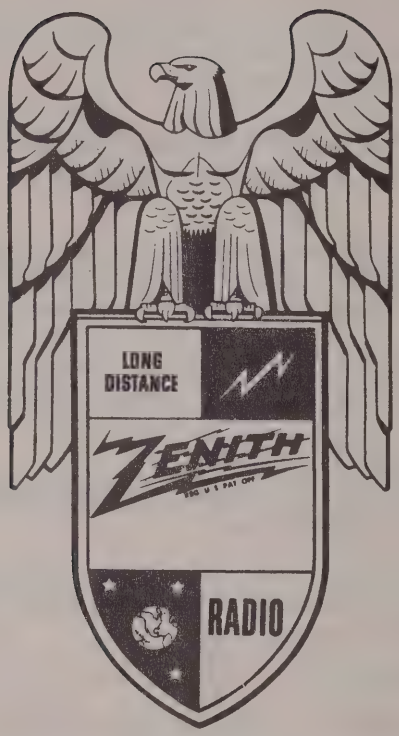
To increase the bass response on records the value of R 5 in the phono pre-amplifier may be increased. Do not increase the value to over 10,000 ohms or audio howl may be heard.

PM SPEAKERS 8H0 AND 9H0 SERIES

Some of the earlier 8C20-21 chassis are wired for electro dynamic speakers only. Later production sets are wired for either electro dynamic or PM speakers which have the filter unit attached to the speaker frame. These chassis are identified by a dot of black paint on or near the speaker socket. To use the PM speakers on the earlier sets, it will be necessary to run a lead from B-(Center Tap of high voltage winding) to a lug on the speaker socket which connects to the negative side of the filter on the speaker.

HUM COMPLAINT ON 9H0 SERIES

Check audio and AC leads to the volume control. The leads from the tone control must be dressed away from the AC leads. The high voltage secondary leads from the power transformer must be dressed away and close to the chassis from the 47,000 resistor on the tap points.



ZENITH RADIO CORPORATION

Service Division

6001 Dickens Avenue

Chicago, Illinois, U.S.A.

ZS1-1M

Printed in U.S.A.

ZENITH

REG U.S. PAT OFF.

•LONG DISTANCE• RADIO

REG U.S. PAT OFF.

HOUSEHOLD RECEIVER SERVICE BULLETIN

NUMBER 2

AUTOMATIC RECORD CHANGER

MODELS S-11468 and S-11680

CHASSIS No. 4C21, 5C01, 5C02, 5C04, 6C01, 6C05, 6C40, 8C01, 8C20, 8C21, 8C40, 11C21, 11C21Z

ZENITH RADIO CORPORATION

CHICAGO, U. S. A.

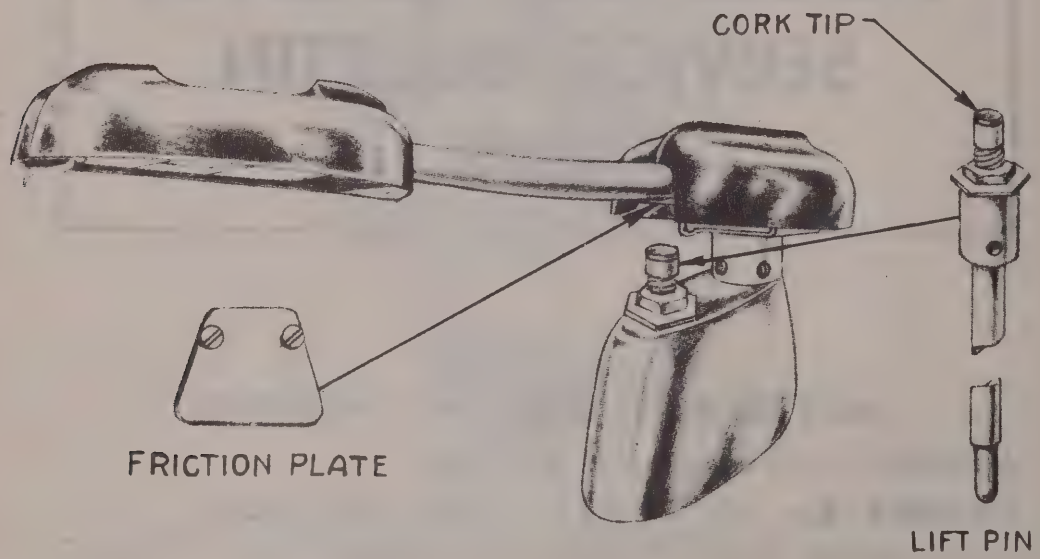
ZS2

Printed in U.S.A.

ERRATIC LANDING OF THE NEEDLE

In the first production of S-11468 non-intermixer record changers, a neoprene cork tipped lift pin, part No. S-13056 was used to stabilize the set down or landing of the needle on the run-in groove of the record. The weight of the tone arm and the friction plate, riding on the neoprene tip of the lift pin was relied on to provide effective braking action. Grease or oil on the neoprene tip of the lift pin will cause erratic landing of the tone arm on the record. To remove the oil or grease, clean the pin tip and friction plate with carbon tetrachloride and roughen with fine sand paper.

Later production S-11468 changers have a spring type brake on the tone arm shaft and use an all metal lift pin, part No. S-13086.



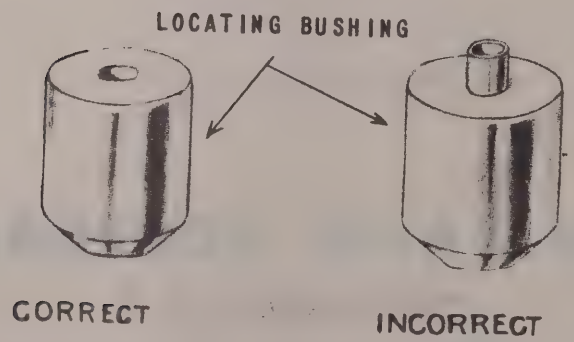


Fig. 1

Erratic landing, where the arm swings sharply to the center of the record or beyond, may be caused by the locating bushing. Replace with a 94-415 bushing.

TONE ARM SKIPS GROOVES AND REPEATS

The vertical hinge on the tone arm may be too tight, causing the arm to hang slightly. This prevents the needle from exerting enough pressure on the record to follow the record grooves. To free the

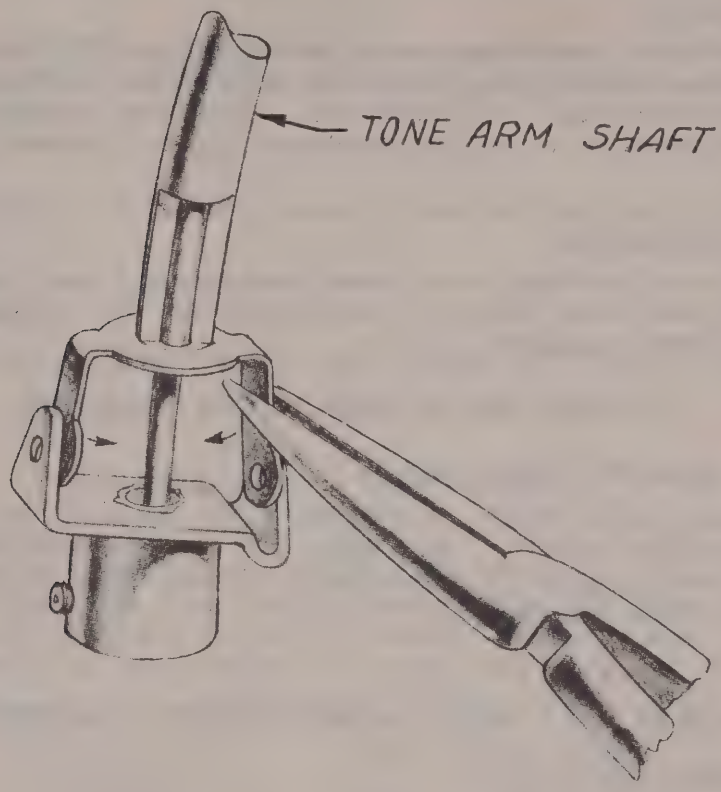


Fig. 2

hinge, use a pair of long nose pliers and bend the horizontal spring "U" bracket until it pivots freely. Be certain that the connecting lead to the crystal cartridge is dressed so that it does not interfere with either the vertical or horizontal movement of the tone arm. THIS IS IMPORTANT.

TONE ARM STICKS NEAR END OF RECORD

Burrs on the trip pawl (Figure 2 Service Manual) will cause the pawl to hang up in the ratchet. Remove the burrs with a sandstone.

MODELS S12600 RECORD DEMONSTRATORS

S11468 AND S11680 RECORD CHANGERS

MOTOR TYPES

Two types of motors are used, Wincharger and General Industries. The Wincharger motor is unmarked. The General Industries motor can be identified by the letters GI stamped underneath the lower bearing support bracket. They are interchangeable except for the following:

DRIVE BUSHINGS

The two motors do not have the same diameter shafts, the spring bushings are also different. The Wincharger motor uses a 80-453 bushing for 60 cycle AC and a 80-452 for 50 cycles. The GI motor (141-94) uses a 80-549 bushing for 60 cycle AC and 80-543 bushing for 50 cycles.

LOOSE DRIVE BUSHING

If the spring drive bushing runs partially off the motor shaft and scrapes the turn-table, apply a thin coat of speaker cement on the motor shaft and reinstall the bushing. Be very careful to wipe off all excess cement otherwise a rough surface may be formed which could cause rumble.

CHANGE IN TRIP MECHANISM

The trip pawl and spring has been removed from latest production changers. The position trip is now used on all production of Models S-11468 and S-11680 changers.

S11680 AND S11468 RECORD CHANGERS

ENLARGEMENT OF RECORD CENTER HOLES

Excessive center hole wear on records is caused by a sharp edge or burrs on the spindle shelf. The edge of the record shelf must be perfectly smooth and slightly rounded. Check the edge, and if sharp, smooth out with fine sandpaper.

CHASSIS 4C21 MODEL S12600 RECORD DEMONSTRATOR

REMOVING THE TURNTABLE

Take out the spindle by prying underneath its flange with a wide, sharp edge screwdriver. When the spindle is removed, insert a punch in the hole and while prying up on the turntable with the fingers, tap the punch until the turntable slips off.

TO DECREASE BASS BOOST

Replace capacitor C7, .02 Mfd. in series with R8, with a .04 Mfd. 200 volt capacitor and take out capacitor C8 (.002 Mfd. 6SC7 plate to ground.)

CHASSIS 5C01, 5C02 AND 5C04 - 5D0 AND 5R0 SERIES

TUBE COMPLEMENT

Alternate tubes used in 5C01 chassis. A single chassis may contain octal, lock-in and miniature button tubes.

Original	Alternate	Alternate
12SA7GT	12BE6	14Q7
35Z5GT	35W4	
12SK7	12BA6	
12SQ7	12AT6	
50L6GT	50B5	

OSCILLATOR SHIFTS

Replace R8 (220 ohms) with a 1,000 ohm resistor.

OSCILLATOR DROPS OUT AT LOW END OF BAND

Remove resistor R1 from common return and connect to cathode of converter.

AUDIO OSCILLATION

Disconnect C13 from the negative return and connect to the cathode of 50L6GT output tube. Take out C20 (plate of 50L6GT to cathode).

ALUMINUM CHASSIS

The letter "V" (5C01V) after a chassis number indicates that an aluminum chassis is used.

HUM AND MICROPHONICS

Check for a grounded tuning capacitor frame to the cabinet ventilator plate.

CHASSIS 6C01 - 6D0 SERIES

TUBE COMPLEMENT

There will be variations in the tube line-up for different 6C01 chassis. A single chassis may contain octal, lockin and miniature button tubes. If an original tube is replaced with an alternate, the socket must also be replaced.

Original	Alternate
35Z5G/GT	35W4
12SQ7GT	12AT6

LOW PITCH HUM

When replacing speakers, use a speaker with the same code letter (49U, AG etc.) as the original. If a speaker with a different code is used, R10 (feedback resistor) may have to be changed. With 49U, H or AG speakers, R10 is 390,000 ohms. When using a 49CS549 speaker, R10 must be 680,000 ohms. R10 is 330,000 ohms for all other speakers.

HOWL

Change Microphonic 14C7 tube.

OSCILLATION, HUM AND POOR SENSITIVITY

Check for grounded tuning capacitor frame. Correct by inserting a rubber pad between the capacitor frame and chassis. Cement in place.

6C05 CHASSIS - 6D0 SERIES

TUBE COMPLEMENT

There will be variations in the tube line-up for different 6C05 chassis. A single chassis may contain octal, lock-in and miniature button tubes.

If an original tube is replaced with an alternate, the socket must also be replaced.

Original	Alternate	Alternate
12SJ7GT		
12SA7GT	12BE6	14Q7
12BA6		
12SQ7GT	12AT6	
35L6GT		
35Z5GT	35W4	

OSCILLATOR SHIFTS

Replace R3 (220 ohms) with a 1000 ohm resistor.

OSCILLATOR DROPS OUT AT LOW END OF BAND

Disconnect R1 (10,000 ohms) from negative return and connect to cathode of converter.

AUDIO OSCILLATION

Disconnect C14 from the negative return and connect to the cathode of the 35L6GT. Take out C21 (plate to cathode 35L6GT).

OSCILLATION AT 910 KC

Change C5 (negative return to chassis) from .05 to .1 MFD.

OSCILLATION, HUM, POOR SENSITIVITY

Check for grounded tuning capacitor frame. Correct by inserting cork or rubber pad between rear capacitor frame and chassis. Cement in place.

ALUMINUM CHASSIS

The letter V (6C05V) indicates an aluminum chassis is used.

CHASSIS 6C40 - 8C40 - 6G001 - 8G005 MODEL

POWER TUBE FAILURE

The ON-OFF switch must be in the OFF position whenever the line plug is inserted into the changeover switch on the rear of the chassis. Failure to do this may cause flashing and possible burn-out of the output tubes.

CUTS OUT

Wavemagnet snap connectors sprung, causing a poor contact. Poor wavemagnet contact through the cabinet hinge.

CABINET CHANGE

The letter X after the model number (6G001YX, 8G005YX) indicates that an aluminum cabinet is used.

CHASSIS 8C01 MODELS 8H023-34

CHASSIS 8C20-8C21 MODELS 8H0-9H0 SERIES

CHASSIS 11C21-11C212 MODELS 12H0 SERIES

IOISY

Rushing noise when volume control is turned to minimum is caused by a poor connection from the grid element to grid cap of the 6S8GT tube. A hot iron and a little flux on the grid cap will remove the high resistance solder joint.

FM OSCILLATOR DRIFTS

Check for a red dot on the oscillator tuning slug wire. If the wire is unmarked, replace with one which has a red dot.

CHASSIS 8C01 MODELS 8H023-34

FLUTTERS ON FM

Installing a 22-1635 20 MFD-150V condenser and two quarter watt resistors, 63-583 1000 ohm and 63.600 2.2 Meg, will eliminate the flutter, see drawing.

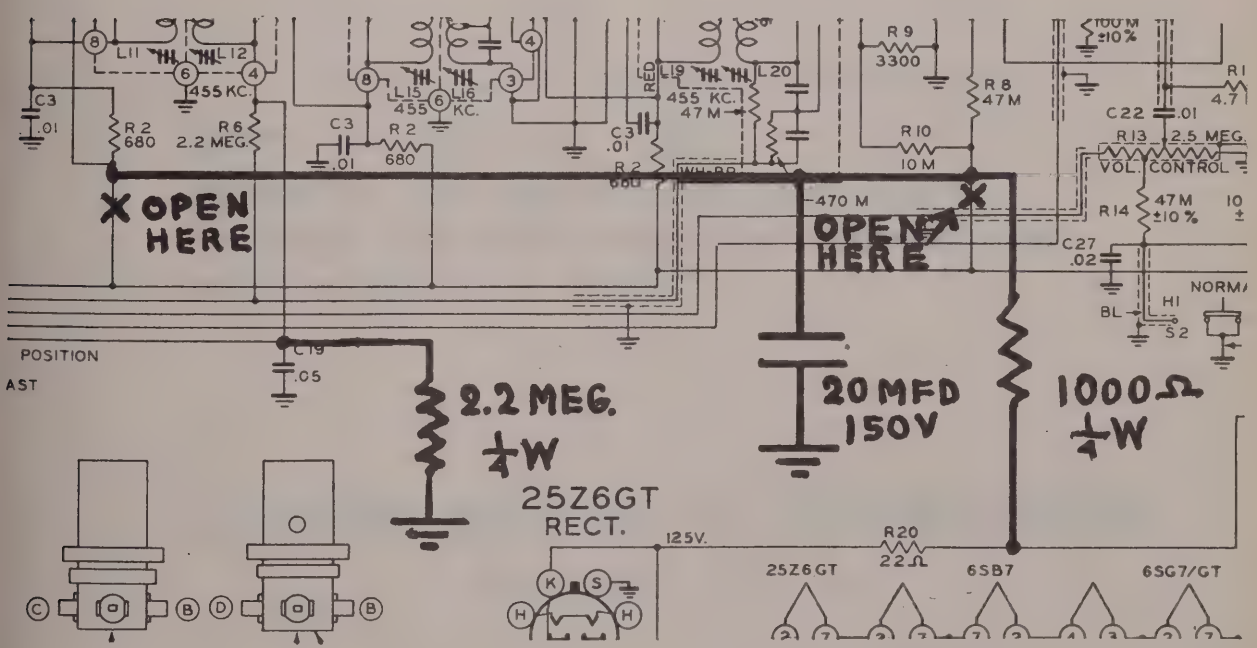


Fig. 3

ZENITH
REG. U. S. PAT. OFF.
LONG DISTANCE RADIO
REG. U. S. PAT. OFF.

HOUSEHOLD RECEIVER SERVICE BULLETIN
NUMBER 3

AUTOMATIC RECORD CHANGER

MODELS S-11468 and S-11680

CHASSIS No. 4C21, 5C02, 5C04, 5C40, 5C40Z, 5C40ZZ
6C05, 6C05Z, 6C22, 6C22Z, 6C22ZZ, 6C40, 6C40Z, 6C41, 6C41Z,
8C01, 8C20, 8C21, 11C21, 11C21Z

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

ZS3—25M—6-47—R. R.

Printed in U.S.A.

HOUSEHOLD SERVICE BULLETIN NO. 3
S11468 AND S11680 RECORD CHANGERS

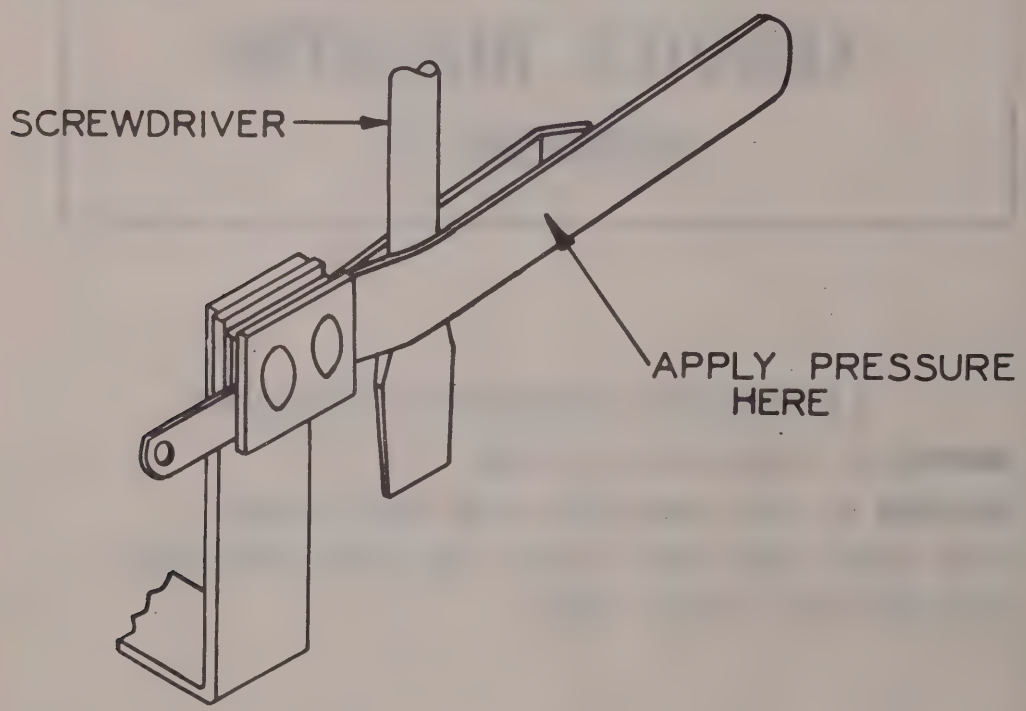
MOTORS FOR 60 CYCLE 117 VOLT AC OPERATION

Motor Part No. 141-104 is now used on the S11468 record changer. The model S11680 record changer uses Motor Part No. 141-105. These motors are alike except for the lead lengths and may be used to replace the earlier 141-92 and 141-94 motors.

MOTORS FOR 50 CYCLE 117-130 VOLT AC OPERATION

Motor Part No. 141-103 is designed for 50 cycle AC operation and can be used to replace the earlier motor types 141-92 and 141-94. Record changers with the 141-92 motors may be operated on 50 cycle AC by inserting a 30 ohm 20 watt resistor in series with the field and replacing the spring drive bushing. Motor Part No. 141-94 may be used on 50 cycle AC by changing the spring drive bushing.

TONE ARM FAILS TO FOLLOW THE OSCILLATING GROOVE ON MANUAL AND JUMPS AT THE BEGINNING OF THE CHANGE CYCLE CAUSED BY TOO MUCH TENSION ON THE CYCLING SWITCH SPRING CONTACT.



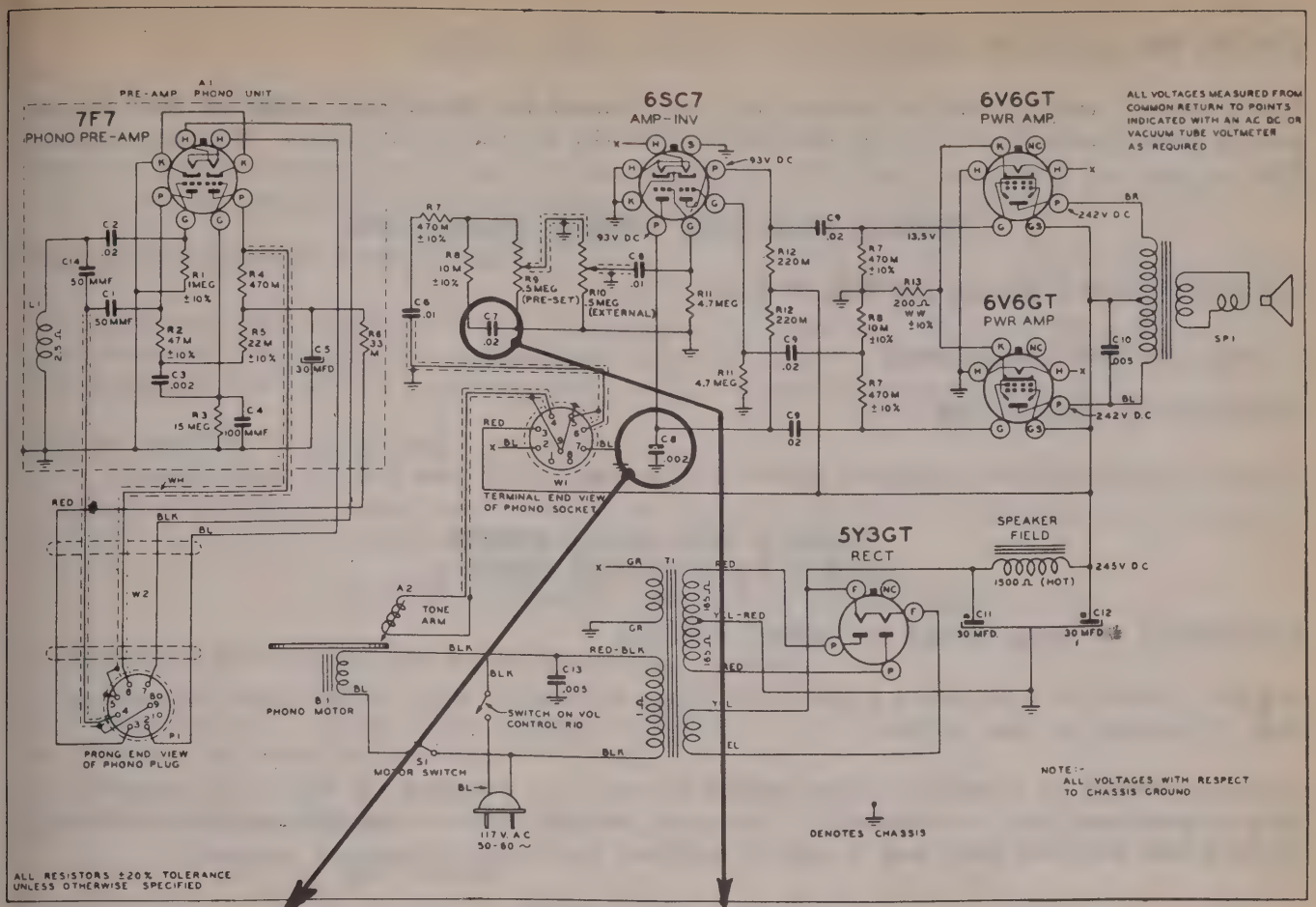
Insert a screwdriver between the contact and guide springs and bend the contact spring so that an approximate pressure of one ounce is necessary to move the contact spring from the guide spring. Be certain that the contact spring exerts some pressure on the guide spring after adjustment.

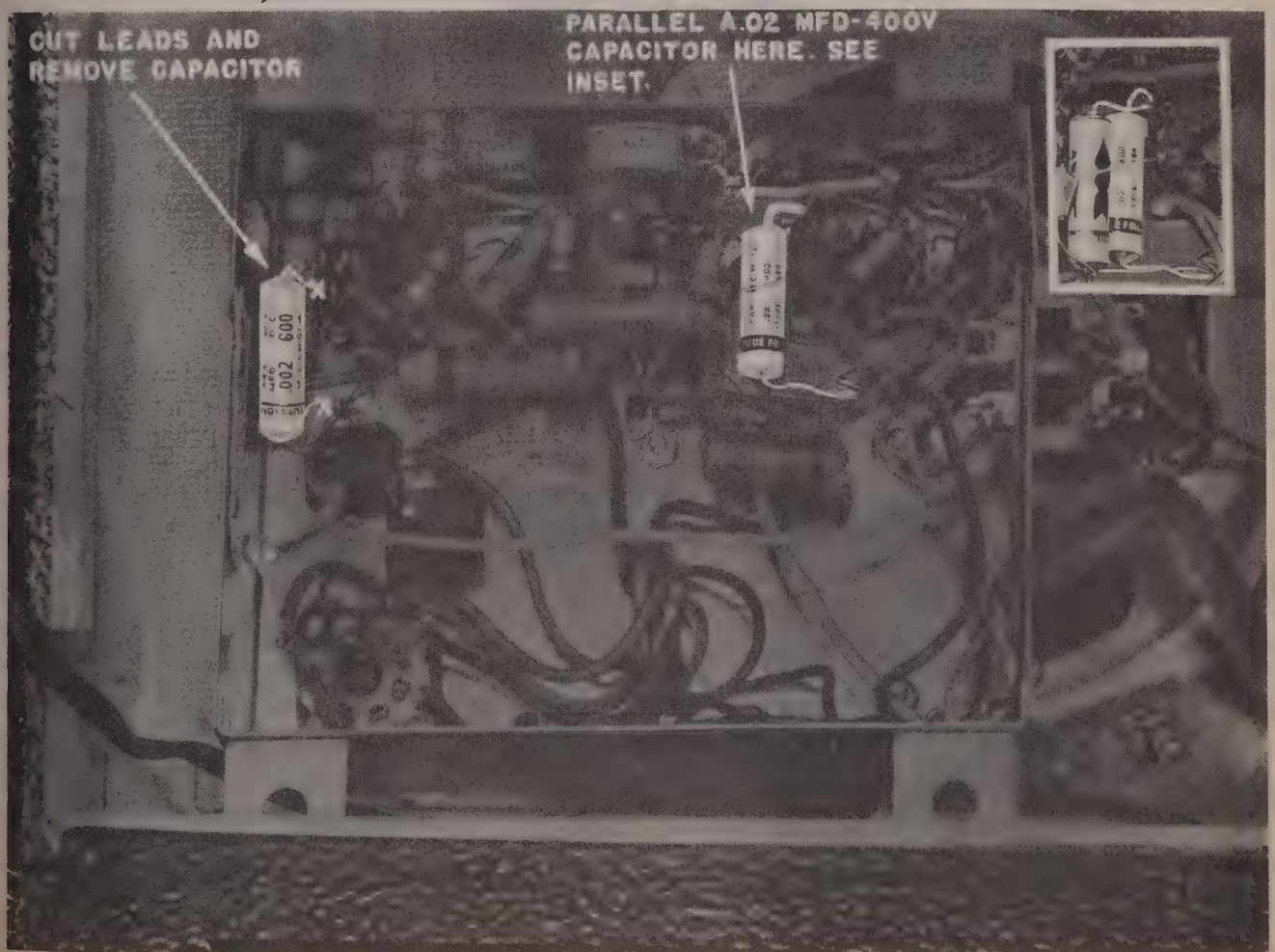
RUMBLE AND MICROPHONICS

Check the idler wheel for a "bump" and replace if necessary.

CHASSIS 4C21 - MODEL S12600

The high frequency tonal range of early production Cobra Demonstrators may be extended by incorporating the change indicated by the schematic and pictorial diagrams. All later releases have this change.


A1
PRE-AMP PHONO UNIT
7F7
PHONO PRE-AMP
6SC7
AMP-INV
6V6GT
PWR AMP.
6V6GT
PWR AMP
5Y3GT
RECT
SPEAKER
FIELD
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN AC DC OR VACUUM TUBE VOLTMETER AS REQUIRED
93V DC
242V DC
13.5V
245V DC
1500Ω (HOT)
30 MFD
TONE ARM
PHONO MOTOR
SWITCH ON VOL CONTROL R10
MOTOR SWITCH
117 V. A.C 50-60 ~
TERMINAL END VIEW OF PHONO SOCKET
PRONG END VIEW OF PHONO PLUG
NOTE:- ALL VOLTAGES WITH RESPECT TO CHASSIS GROUND
DENOTES CHASSIS
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED


CUT LEADS AND REMOVE CAPACITOR
PARALLEL A.02 MFD-400V CAPACITOR HERE. SEE INSET.

RUSHING AND CRACKLING NOISE

The rushing and crackling noise may be caused by the break-down of the 50 MMF silver mica capacitor (C1) in the plate circuit of the oscillator. Replace capacitor.

CHASSIS 5C02-5C04 MODELS 5R080-5R086

OSCILLATOR DROPS OUT ON LOW END OF BAND

Replace the oscillator coil.

UNCONTROLLED OSCILLATION

Connect a 470,000 ohm resistor across the secondary of the 1st IF transformer.

CHASSIS 5C40-5C40Z-5C40ZZ
MODELS 5G003-5G003Z-5G003ZZ

DIFFERENCES IN 5C40, 5C40Z AND 5C40ZZ CHASSIS

Chassis 5C40Z is similar to the 5C40 chassis except that a selinium rectifier is used in place of the 117Z3.

Chassis 5C40ZZ is similar to the 5C40Z except for changes in the oscillator coil, gang capacitor and wavemagnet. Chassis 5C40ZZ uses a S13765 oscillator coil, 22-1653 two section gang and a S13767 cabinet back and wavemagnet assembly.

CHASSIS 6C05-6C05Z
MODELS 6D015-6D030-6D015 -6D030Z

OSCILLATOR DROPS OUT ON LOW END OF BAND

Replace oscillator coil.

CHASSIS 6C22-6C22Z-6C22ZZ
MODELS 6R087-6R087Z-6R087ZZ

DIFFERENCES IN 6C22, 6C22Z AND 6C22ZZ CHASSIS

The 6C22Z chassis is similar to the 6C22 except for the resistive capacitive filter and PM speaker. The 6C22ZZ chassis is similar to the 6C22Z except for differences in the wavemagnet, tuning gang and oscillator coil.

CHASSIS 6C40-6C40Z
MODELS 6G001-6G001Z

INSUFFICIENT POWER OUTPUT

To improve power output, replace R17 (870 ohm WW resistor) with 820 ohms.

CHASSIS 6C41-6C41Z
MODELS 6G004Y-6G004YZ

INSUFFICIENT POWER OUTPUT

To improve power output, replace R11 (870 ohm WW resistor) with 820 ohms.

CHASSIS 8C01 MODELS 8H023-8H034

OSCILLATOR SHIFTS ON 45 MC FM

Replace the 22-1571 oscillator trimmer with 22-1646 and connect a 22-1509 ceramic capacitor in parallel with 22-1646.

MODULATION HUM AND DISTORTION

To eliminate modulation hum and distortion disconnect R22 (the 1000 ohm resistor connected to the rectifier side of the speaker field - yellow lead) and reconnect to the opposite end (black lead) of the field. Check capacity of C23.

140 MC AMATEUR INTERFERENCE

Connect a 500 MMFD capacitor from each leg of the 6S8GT filament to chassis and another from grid to chassis.

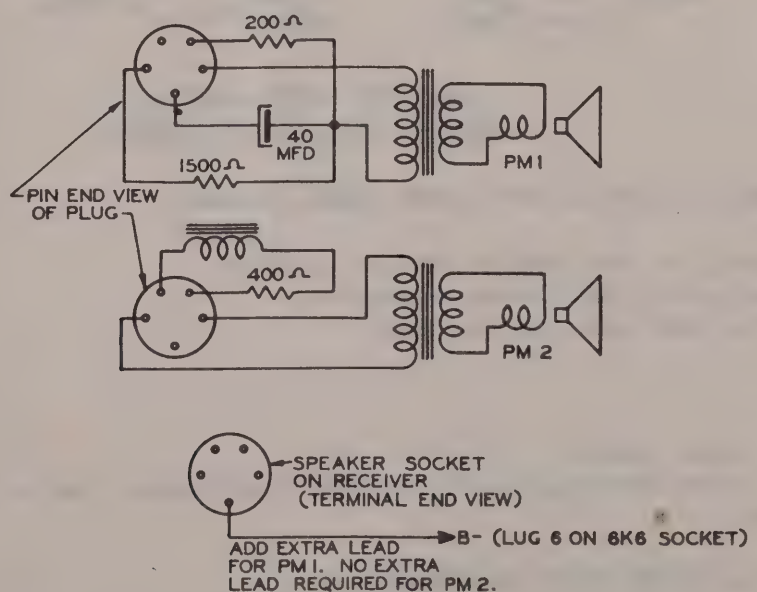
CHASSIS 8C20-8C21 MODELS 8H0-9H0 SERIES

OVERLOADING AND DISTORTION ON STRONG LOCAL SIGNALS

1. Connect pin 7 of the 6AG5 socket to chassis.
2. Replace R1 with 33,000 ohms.
3. Replace R17 with 22 ohms.
4. Replace the 6AG5 tube with a 6BA6.

PM SPEAKERS 8H0 AND 9H0 SERIES

Some of the earlier 8C20-21 chassis are wired for electro dynamic speakers only. Later production sets are wired for either electro dynamic or PM speakers which have the filter unit attached to the speaker frame. These chassis are identified by a spot of black paint on or near the speaker socket. To use the PM speakers on the earlier sets, it will be necessary to run a lead from B-(Center Tap of high voltage winding) to a lug on the speaker socket which connects to the negative side of the filter on the speaker.



140 MC AMATEUR INTERFERENCE

Connect a 500 MMFD capacitor from the grid of the 6S8GT tube to ground.

RESIDUAL HUM.

Connect a .002 MFD capacitor from the transformer side of the line antenna choke to ground.

OSCILLATOR SHIFTS ON 45 MC FM

Replace the 22-1571 oscillator trimmer with 22-1646 and connect a 22-1509 ceramic capacitor in parallel with 22-1646.

RUSHING, CRACKLING NOISE ON BROADCAST BAND

Replace the 10 MMFD ceramic capacitor C27.

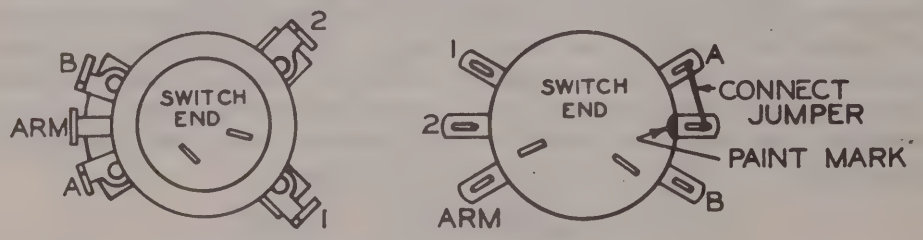
RUSHING AND CRACKLING NOISE ON PHONO (8C21 CHASSIS)

Replace the 50 MMFD capacitor in the plate circuit of the phono pre-amplifier (pin 6, 7F7 socket).

CODING ON THE 63-1466 AND 63-1349 VOLUME CONTROLS

The 63-1466 volume control used on the 8C20 and 8C21 chassis, has the code letter Y or EX stamped after the part number. Electrically the Y and EX controls are identical while physically they differ in the placement of the connecting lugs. To interchange these controls, follow the below diagrams and be certain that the numbers and letters match (A to A, 1 to 1 etc.). The Y control has an extra lug which connects to the internal shield. This lug is marked with a yellow paint mark and must be connected to lug A.

The above also applies to the 63-1349 volume control which is used in the 11C21 chassis.



CHASSIS 11C21-11C21Z
MODELS 12H0-12H0Z SERIES

OVERLOADING AND DISTORTION ON STRONG LOCAL SIGNALS

1. Connect pin 2 of the 6AG5 socket to chassis.
2. Replace R3 with a 33,000 ohm resistor.
3. Replace the 6AG5 tube with a 6BA6.

RESIDUAL HUM

1. Check the 6J5GT tube.
2. Connect a .002 MFD capacitor from the transformer end of the line antenna choke to chassis.

RUSHING AND CRACKLING NOISE ON PHONO

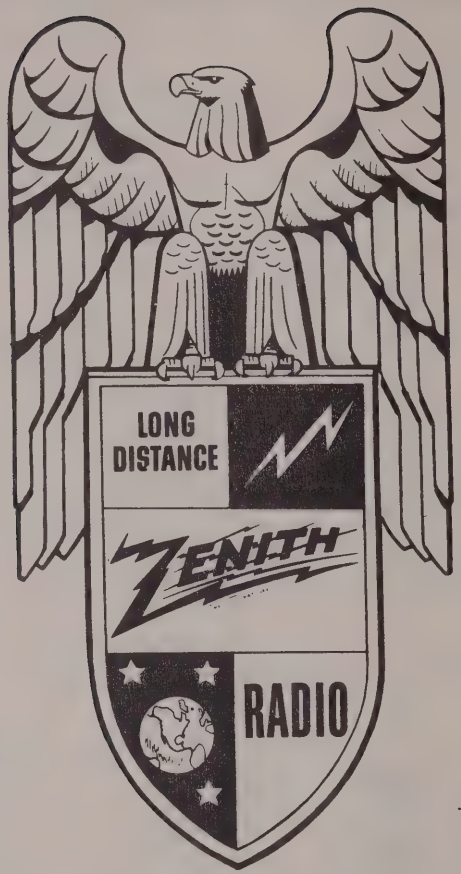
Replace the 50 MMFD capacitor in the plate circuit of the phono pre-amplifier (pin 6,7F7 socket).

140 MC AMATEUR INTERFERENCE ON RADIO AND PHONO

Connect a 500 MMFD capacitor from the grid of the 6S8GT tube to chassis.

POOR SENSITIVITY ON THE BROADCAST BAND

Check the wavemagnet. The paint mark on the wavemagnet must match the mark on the chassis. Replace with wavemagnet of proper inductance.



ZENITH RADIO CORPORATION

Service Division

6001 Dickens Avenue

Chicago, Illinois, U.S.A.

ZENITH
REG U S PAT OFF
LONG DISTANCE RADIO
REG U S PAT OFF

HOUSEHOLD RECEIVER SERVICE BULLETIN NUMBER 4

RECORD CHANGER MODELS S13675, S14001, S14002, S14006 and S14008.

CHASSIS No. 4E41, 5C40, 5C50, 6E02, 7E01, 8C21, 8C40, 9E21, 11C21 and 13D22.

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

ZS4--25M--2-48--R.R.

PRINTED IN U.S.A.

HOUSEHOLD SERVICE BULLETIN NO. 4

RECORD CHANGERS
S 13675, S 14001, S 14002, S 14006, S 14008

NOISY DURING CYCLE

Remove the 10,000 ohm resistor from the trip switch and replace with 63-1744 100 ohm ½ watt carbon resistor.

RECORD CENTER HOLE WEAR

A bent spindle impedes record ejection and causes center Hole wear. The position of the spindle may be checked with a 10" record as shown. A properly centered spindle will form a triangle with the outer tips of the record shelf plate.

MODEL S 14001 SPINDLE RATTLES

Add a 93-901 spring washer underneath the spindle retaining ring.

CHASSIS 4E41
MODEL 4G800

DISTORTION

On some 4E41 chassis a 63-1583 candohm (R19 and R20) was used. A 2500 ohm resistor was paralleled with R20 to give the proper filament distribution. If the 2500 ohm resistor is omitted, the filament voltage will be low and distortion will result. All later production receivers use the 63-1647 candohm. If the 63-1583 candohm is replaced with 63-1647, the parallel resistor must be omitted or the filament voltage will become dangerously high.

CABINET SCRATCHES

Cabinet scratches may be removed by applying Simoniz Cleaner with a cheesecloth pad. The cleaner is applied with a circular motion.

SWOLLEN OR LEAKING BATTERIES

It is common knowledge that a dry battery may leak or swell when subjected to extreme service conditions. A direct "short" across the battery circuit in a receiver, or a receiver in which the battery switch has been left on for a continuously long period, completely exhausting the batteries, may cause this condition. This is particularly true with "A" batteries.

CHASSIS 5C40
MODEL 5G003

CABINET SCRATCHES

Apply Simoniz Cleaner with a cheesecloth pad. Rub with a circular motion.

CHASSIS 5C50
MODEL 5K037

OSCILLATOR STOPS

Replace the 63-581 470 ohm $\frac{1}{4}$ watt resistor with a 63-1786 1000 ohm $\frac{1}{2}$ watt resistor.

CHASSIS 6E02
MODEL 6R886

HISSING AND FRYING NOISE ON PHONO

Replace the 50 MMFD capacitor in the phono oscillator plate circuit with a 22-1664 50 MMFD ceramic capacitor.

PHONO DEAD

Check the 6C4 phono oscillator tube. The filament of this tube can collapse and still complete the filament circuit.

CHASSIS 7E01
MODEL 7H820

PILOT LIGHT HEATS CABINET

Apply a 2" width of Minnesota Mining Aluminum Foil to the front inside of the cabinet in front of the pilot light. The foil should also be applied to the inside top directly above the pilot light and extending to the rear of the cabinet. The aluminum foil will reflect the heat to the rear of the cabinet.

FRYING AND CRACKLING NOISE

A noise similar to atmospherics has been traced to the 110 volt pilot light. Replace.

CHASSIS 8C21
MODELS 9H079, 9H082, 9H085 AND 9H088.

PHONO DEAD OR CUTS OUT

Increase in resistance of the phono pre-amplifier 470,000 ohm plate resistor under load. Replace.

HISSING AND FRYING NOISE ON PHONO

Replace the 50 MMFD capacitor in the phono oscillator plate circuit with a 22-1664 50 MMFD ceramic capacitor.

CHASSIS 8C40T
MODEL 8G005

DISTORTION AND LOW AUDIO OUTPUT

Increase in resistance of the 4.7 megohm 1LD5 screen resistor under load. Replace.

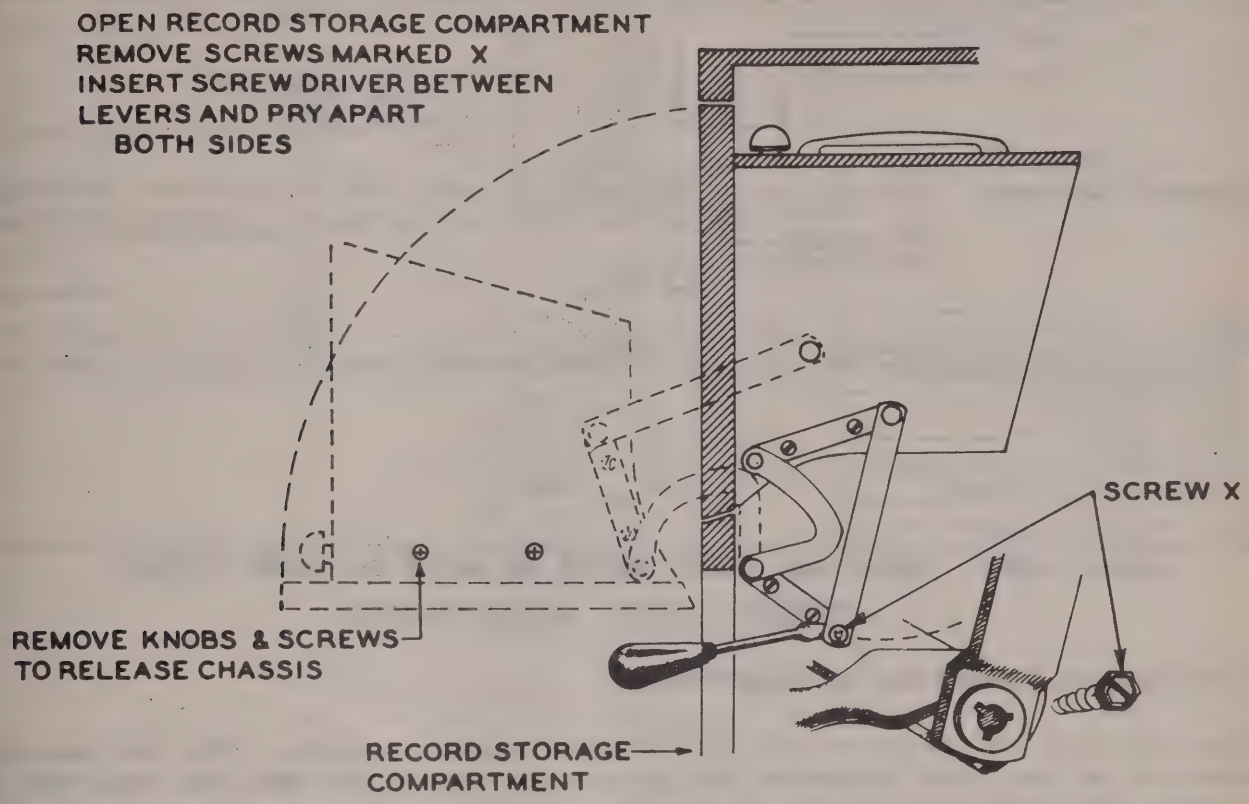
DIFFERENCES BETWEEN 8C40T, 8C40TZ AND 8C40TZ1

Chassis 8C40TZ has a change in band switch and coils. Chassis 8C40TZ1 has the new band switch plus a change in tube line-up. The 117Z6 has been replaced by a 117Z3 and the converter tube changed from 1LC6 to 1LA6. When checking these receivers be sure to use the correct schematic.

CHASSIS 9E21
MODELS 9H881, 9H885, 9H888.

RADIORGAN

Heretofore the LO BASS and TREBLE Radiorgan buttons were effective when pulled out. The Radiorgan on Models 9H881, 9H885, and 9H888 is different in that these buttons are effective when DEPRESSED. Starting with all the buttons up, the degree of bass is increased by first depressing LO BASS, then VOICE and then NORMAL. With all these buttons depressed, the greatest degree of bass is reproduced. Conversely the degree of TREBLE is increased by starting with all the buttons up and depressing TREBLE, then BASS and then ALTO. With these three buttons depressed the greatest degree of brightness is attained. It is from this basic analysis of Radiorgan action that all the other combinations of tone are made.



Except for the first release of models 9H885 and 9H888, these models will have collapsible hinges to facilitate removal of the chassis from the front of the cabinet. To remove the chassis, open the record storage compartment and take out the two screws marked "X". Insert a screwdriver between the two plates as shown and pry apart. The bin will come forward and the chassis can be easily removed. These models also have a cinch cap which may be removed for RF trimmer adjustments while the chassis is mounted in the cabinet.

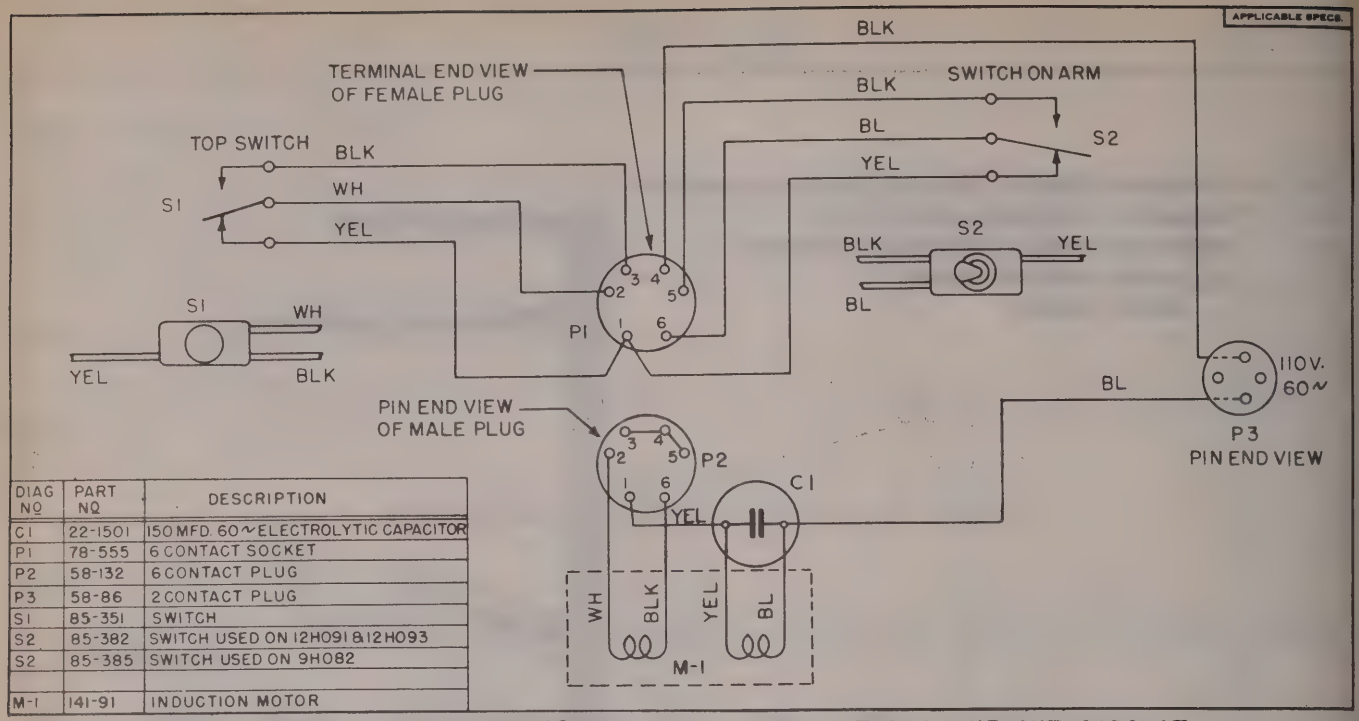
CHASSIS 11C21 - 11C21Z
MODELS 12H090, 12H091, 12H092, 12H093, 12H094.

PHONO DEAD OR CUTS OUT

Increase in resistance of the 470,000 ohm phono pre-amplifier plate resistor under load. Replace.

HISSING AND FRYING NOISE ON PHONO

Replace the 50 MMFD capacitor in the phono oscillator plate circuit with a 22-1664 50 MMFD ceramic capacitor.



DIAG NO	PART NO	DESCRIPTION
C1	22-1501	150 MFD. 60~ELECTROLYTIC CAPACITOR
P1	78-555	6 CONTACT SOCKET
P2	58-132	6 CONTACT PLUG
P3	58-86	2 CONTACT PLUG
S1	85-351	SWITCH
S2	85-382	SWITCH USED ON 12H091 & 12H093
S2	85-385	SWITCH USED ON 9H082
M-1	141-91	INDUCTION MOTOR

MODELS 9H082, 12H091 AND 12H093 SWITCH AND MOTOR DRIVE-OUT CIRCUIT

CHASSIS 13D22 MODEL 14H789

DISTORTION AND OVERHEATING OF 6V6GT TUBES

Check the grid resistors in the audio power supply chassis. The two resistors connected to the 6J5GT inverter grid (pin 5) should be 63-1848 33M (was 47M) and 63-1880 180M (was 330) ohms. The resistor on the grid side of the 6J5GT plate coupling capacitor should be 63-1883 220M (was 470M) ohms.

APPLYING DI-NOC AND MEYERCORD PHOTOSTAT TRANSFERS

To simplify application of transfers to cabinets, we suggest that you proceed as follows:

1. Do not try to make application on bare wood. Be sure that the surface to be repaired is smooth and free from wax or polish. Fill in dents and scratches with stick shellac, and resurface with lacquer.

2. Immerse the transfers in water until the backing is loosened. Strip the paper backing from the transfer.

3. Apply the water soaked transfer to the cabinet area to be covered, move it around into position. Keep the transfer wet with water during this operation.

4. When the transfer is in the exact position to be covered, sponge off the excessive water.

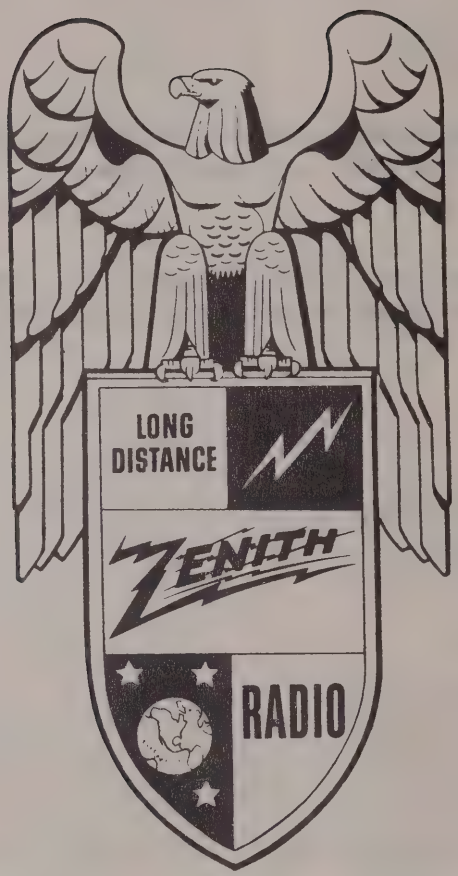
5. Lift and fold over half of the transfer, and apply welding solution to the surface of the cabinet uncovered, lay the transfer back into position and squeegee out the air bubbles, and the excessive welding solution. Repeat the operation on the other half of the transfer to be welded to the surface.

Welding a portion of the transfer to the cabinet at one time simplifies the application. To remove small air bubbles from under the transfer that cannot be squeegeed out, puncture the bubble with a pin, or the sharp edge of a razor blade. Overlapping edges of the transfer can be removed by scraping the edge of the panel with a razor blade or sandpaper. Remove excess solution with damp cloth and dry face of cabinet.

CLEANING DIAL CRYSTALS

Remove the dial crystal and clean with Parkers Perfect Polish. The polish neutralizes static charges, which attract dust particles.

Your ideas and suggestions are of great assistance in compiling these Service Bulletins. Please continue to write us whenever you have something of interest.



ZENITH RADIO CORPORATION

Service Division

6001 Dickens Avenue

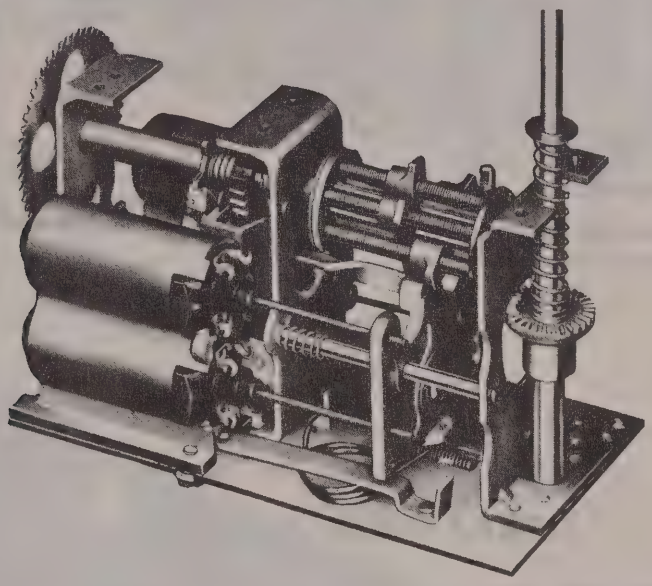
Chicago, Illinois, U.S.A.

SERVICE MANUAL

ZENITH

LONG DISTANCE AUTO RADIO

1946 AUTO RADIO PERMEABILITY TUNING UNIT



This bulletin was prepared to assist the service man in servicing the permeability tuning units of the 1946 automobile radios manufactured by the Zenith Radio Corporation for the various motor car companies.

The operating principle and the mechanical adjustments of the tuning units are the same in all receivers. There is, however, a variation on the front plate, dial pointer, and escutcheon assemblies. This bulletin gives a step by step procedure for replacing both the ratchet gear and the solenoid on each model. A Parts List is supplied for each model. An exploded view of the tuning mechanism listing each part by number makes the identification of parts and part numbers positive. Causes of failure with suggestions for servicing are also included in this bulletin.

ZENITH RADIO CORPORATION
CHICAGO 39, U.S.A.

Form 2 R

Printed in U.S.A.

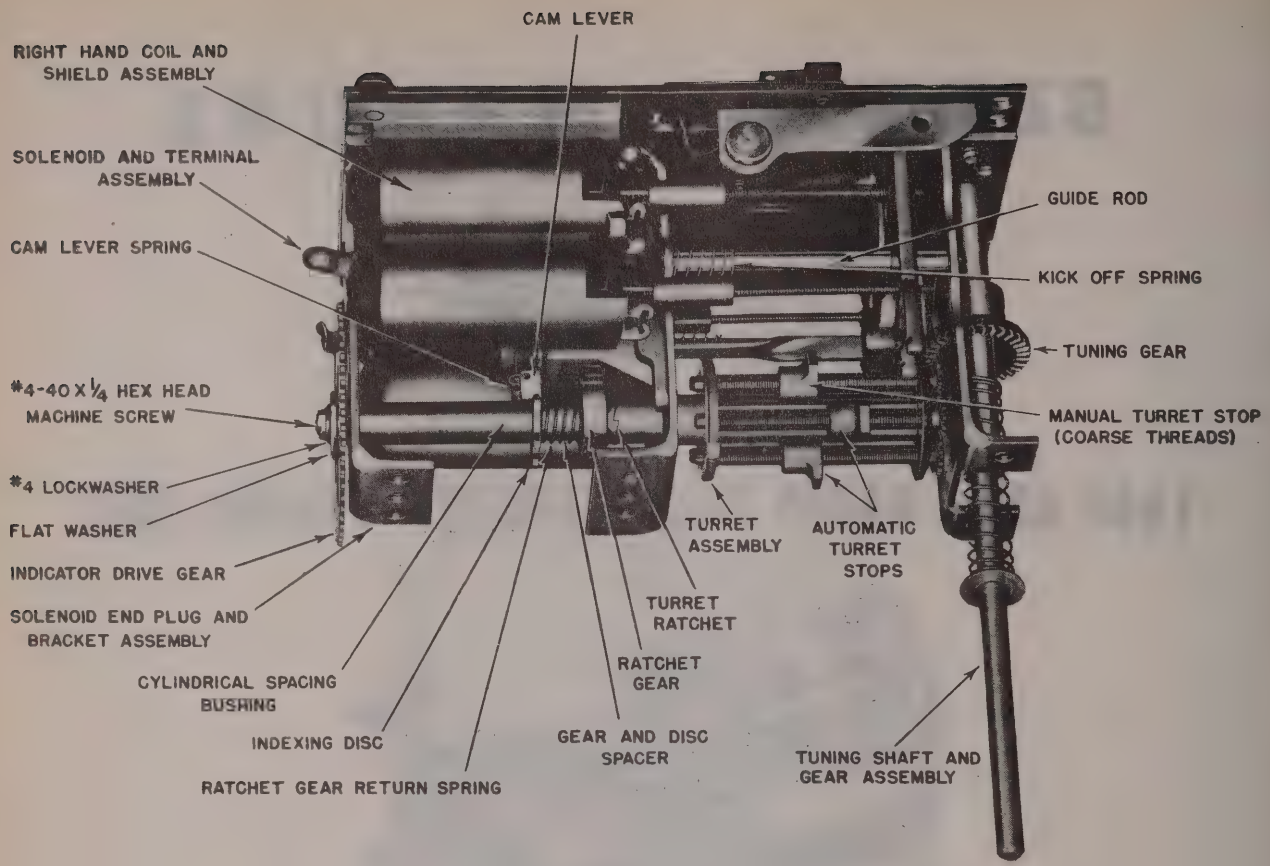


FIG. 1

OPERATING PRINCIPLE

When the station selector push button or foot switch is depressed all the way, the solenoid (Fig. 1) is energized by current from the car battery. The cross arm assembly is pulled from the right or resting position from any one of the six turret stops on the turret assembly to the left or closed position. As this assembly approaches the closed position, the ratchet cam shaft (Fig. 2) turns the ratchet drive gear clockwise. The ratchet drive gear turns the ratchet gear counter clockwise 60° or until it engages the ratchet teeth on the turret shaft. The detent lever (inset Fig. 2) prevents the turret assembly from turning counter clockwise during this operation. At the same time a cam on the hub of the ratchet drive gear lifts the cam lever from its locking position in the indexing disc (inset Fig. 2). This will allow the turret assembly (Fig. 2) to be turned clockwise. The tuning unit will remain in the closed position until the push button or foot switch is released.

When the push button or foot switch is released the cross arm return spring pulls the cross arm assembly back to the resting position. As this assembly starts the return stroke to the resting position, the ratchet camshaft turns the ratchet drive gear counter clockwise. The ratchet drive gear turns the ratchet gear clockwise 60°. As the ratchet gear turns it rotates the turret assembly clockwise 60°. When the turret assembly has been turned 60°, the cam lever is pulled into locking position in the indexing disc, preventing the turret assembly from moving farther.

There are six turret stops, one for each of the five automatic tuning positions, which may be adjusted to five desired stations, and one to be used for tuning the radio manually. For information concerning setting up the five automatic tuning positions refer to Owner's Manual or the Service Manual for the radio in question.

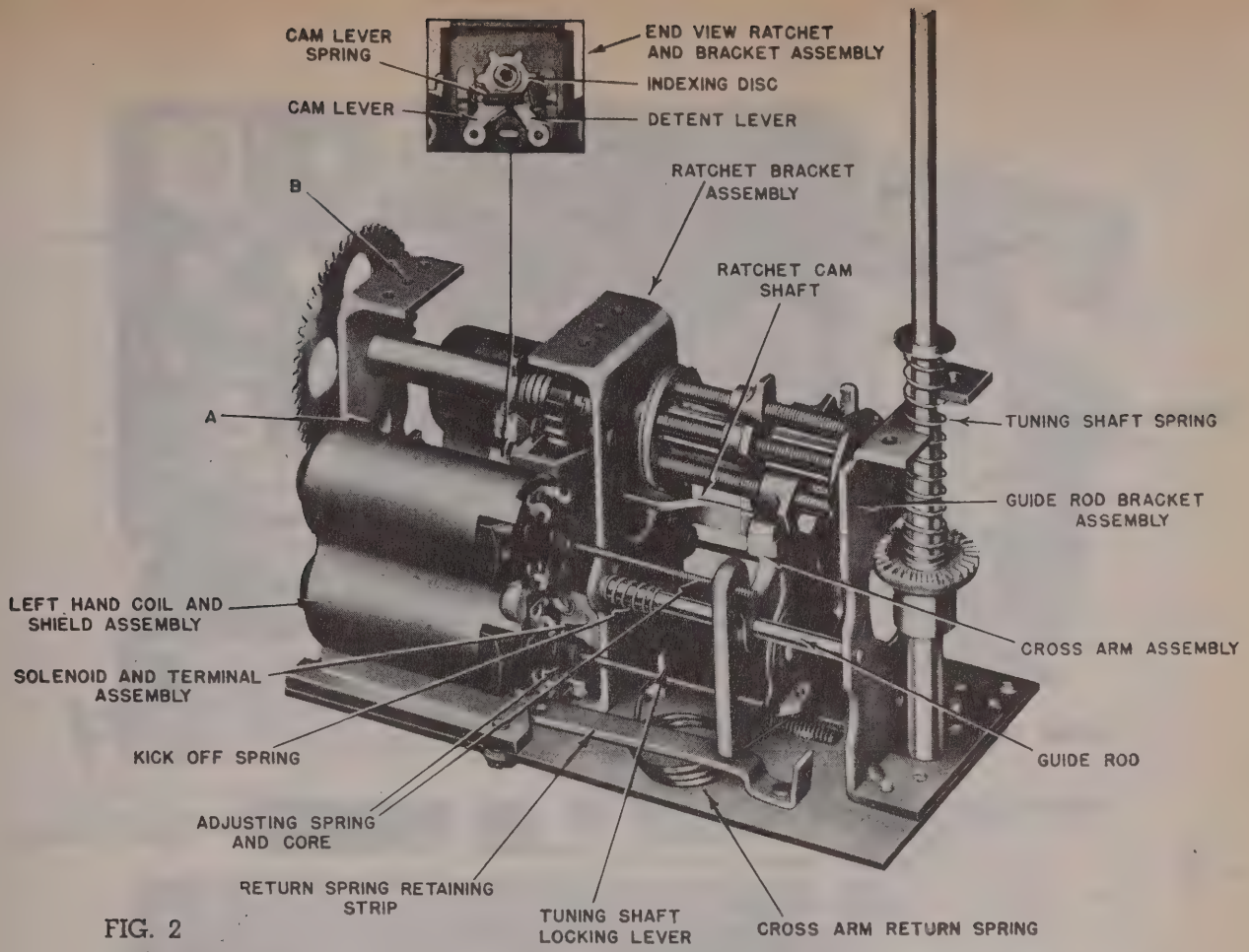

CAM LEVER SPRING
CAM LEVER
END VIEW RATCHET AND BRACKET ASSEMBLY
INDEXING DISC
DETENT LEVER
RATCHET BRACKET ASSEMBLY
RATCHET CAM SHAFT
B
A
TUNING SHAFT SPRING
GUIDE ROD BRACKET ASSEMBLY
LEFT HAND COIL AND SHIELD ASSEMBLY
CROSS ARM ASSEMBLY
SOLENOID AND TERMINAL ASSEMBLY
KICK OFF SPRING
GUIDE ROD
ADJUSTING SPRING AND CORE
RETURN SPRING RETAINING STRIP
TUNING SHAFT LOCKING LEVER
CROSS ARM RETURN SPRING

FIG. 2

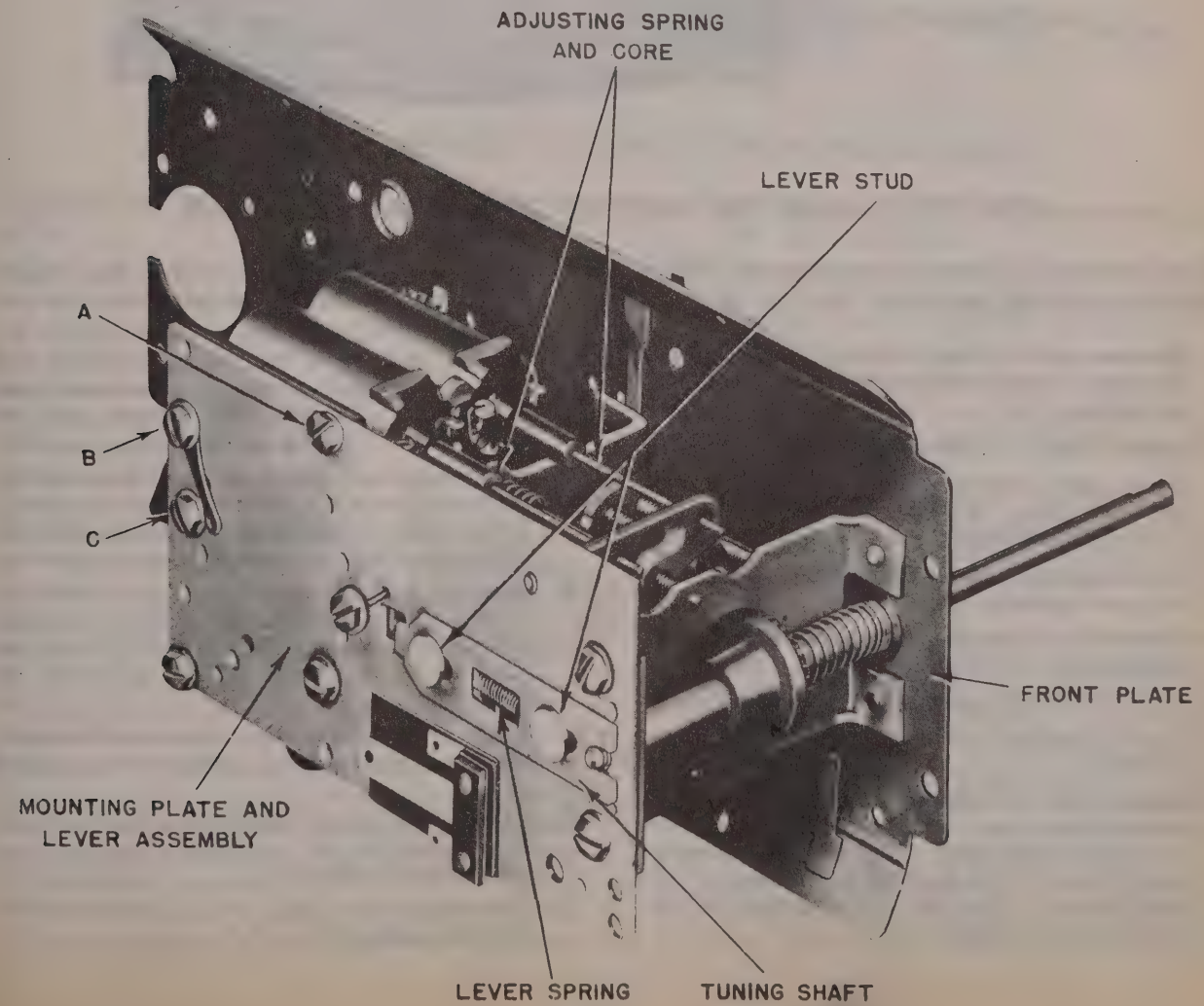
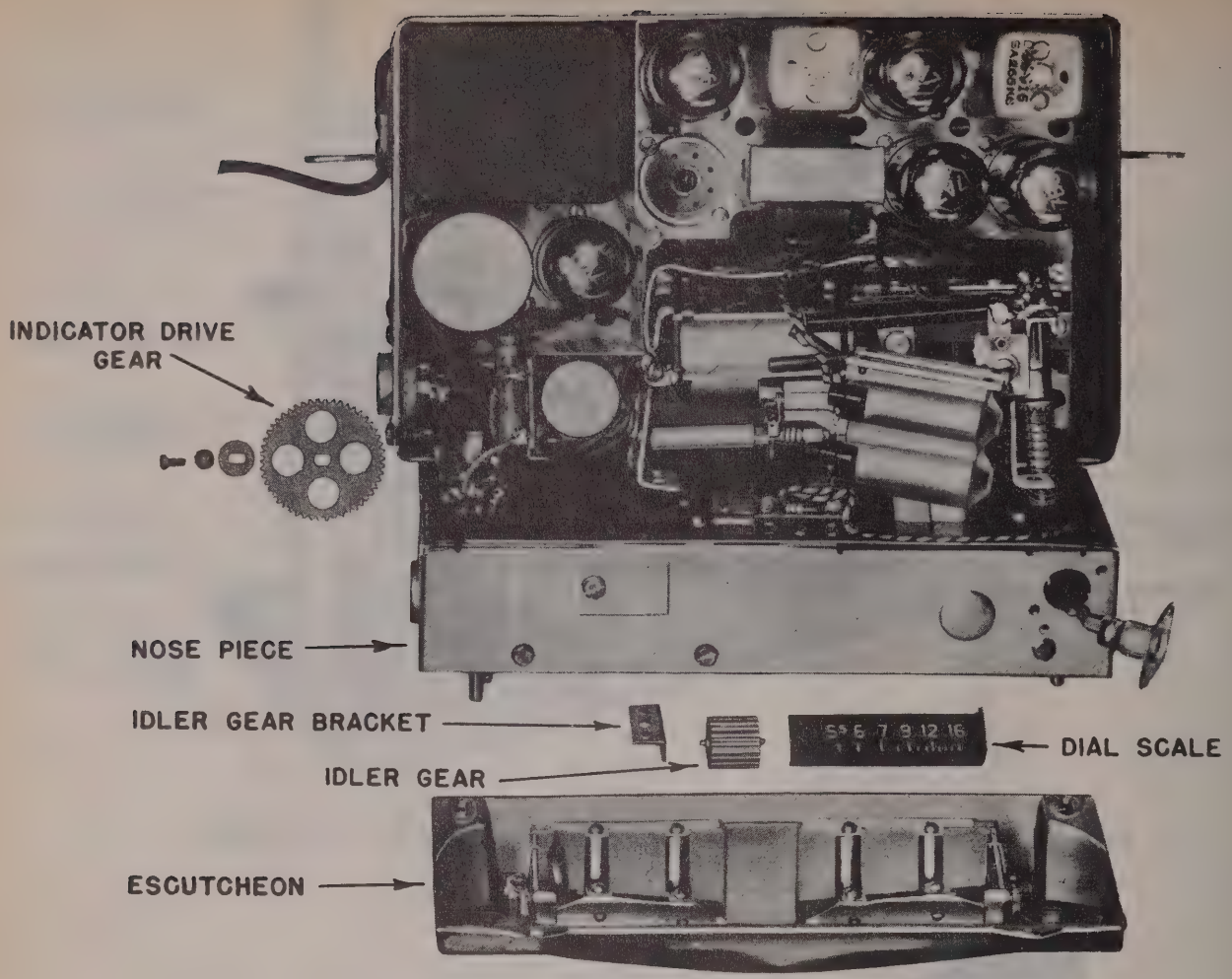

ADJUSTING SPRING AND CORE
LEVER STUD
A
B
C
FRONT PLATE
MOUNTING PLATE AND LEVER ASSEMBLY
LEVER SPRING
TUNING SHAFT LOCKING LEVER

FIG. 3



HOW TO CHANGE THE RATCHET GEAR IN MODEL 6MF080

Before starting the following operations BE SURE THE TUNER IS ON MANUAL. Set Dial at 16.

1—Remove the top and bottom covers of the receiver. Remove 7C5 and 7B6 tubes. Take off knobs.

2—Remove the complete escutcheon assembly.

3—Loosen the antenna socket and trimmer from the nose piece. NOTE: On this receiver the nose piece and front plate are welded together.

4—Loosen the speaker socket on the left hand of the nose piece.

5—Remove the drum dial idler gear and bracket, also the dial scale.

6—Loosen the tuner assembly from the front plate.

7—Loosen the front plate and nose piece from receiver.

8—Remove the two assembly screws in the back plate of the tuner holding the top right coil and shield assembly. Slip the coils toward the left end of the receiver until clear of the tuner slugs. This will allow access to the turret shaft and gear.

9—Remove the screw lock washer, flat washer and brass indicator drive gear from the end of turret shaft.

10—Remove the screw holding the solenoid end plug and bracket assembly to the back plate of the tuner. IMPORTANT: Remove only the one screw holding the bracket to the rear plate.

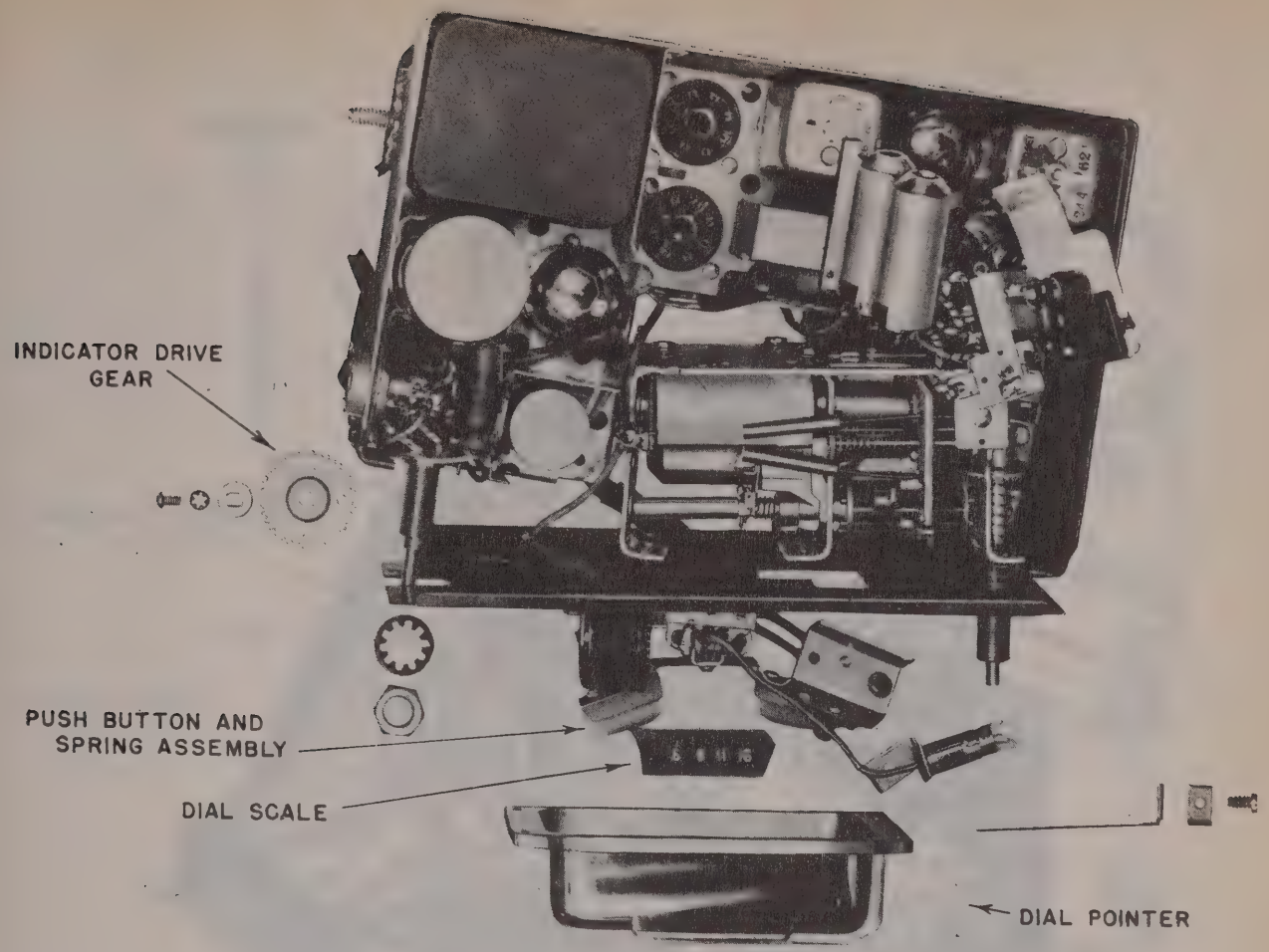
11—Disconnect one side of the small lever spring. Be careful not to lengthen or distort this spring. If the spring is distorted the detent and cam levers may not work properly after assembly.

12—Remove the long cylindrical brass spacer, indexing disc, ratchet return spring and short cylindrical spacer. IMPORTANT: Note the position of the teeth before removing the ratchet gear.

13—Replace the ratchet gear. Make sure the teeth are in exactly the same position as the original gears.

14—Be sure the tuning mechanism and indicator drum is in the "M" position when replacing the indicator idler gear.

15—Reassemble the tuner unit in reverse order. Replace front plate and dial scale.



HOW TO CHANGE THE RATCHET GEAR IN MODEL 6MH081

BE SURE THE TUNER IS ON MANUAL. Set Dial at 16.

1—Remove the top and bottom covers of the receiver. Remove 7C5 and 7B6 tubes.

2—Remove the knobs and the complete escutcheon from the front plate.

3—Loosen the front plate from the receiver.

4—Remove the ⅜" nut and lock washer from the volume control shaft.

5—Remove the dial pointer from the tuner assembly.

6—Remove the automatic station selector switch, and pilot light bracket from the front plate.

7—Remove plastic push buttons and spring assembly.

8—Remove the screws holding the front plate to the tuner.

9—Remove the dial scale from its mounting to avoid scratching.

10—Remove front plate from receiver.

11—Pull the front plate from the left end of the receiver until it clears the volume control shaft.

12—Loosen the antenna socket and bracket from the tuning assembly.

13—Loosen the right hand top two turret coils. Slip the coils to the left end of the set until free of the tuning slugs. This will allow access to the turret shaft and gear.

14—Remove the screw and lock washer, and flat washer from the end of the turret shaft. Remove the brass indicator drive gear.

15—Remove the rear assembly screw from the solenoid end plug and bracket assembly.

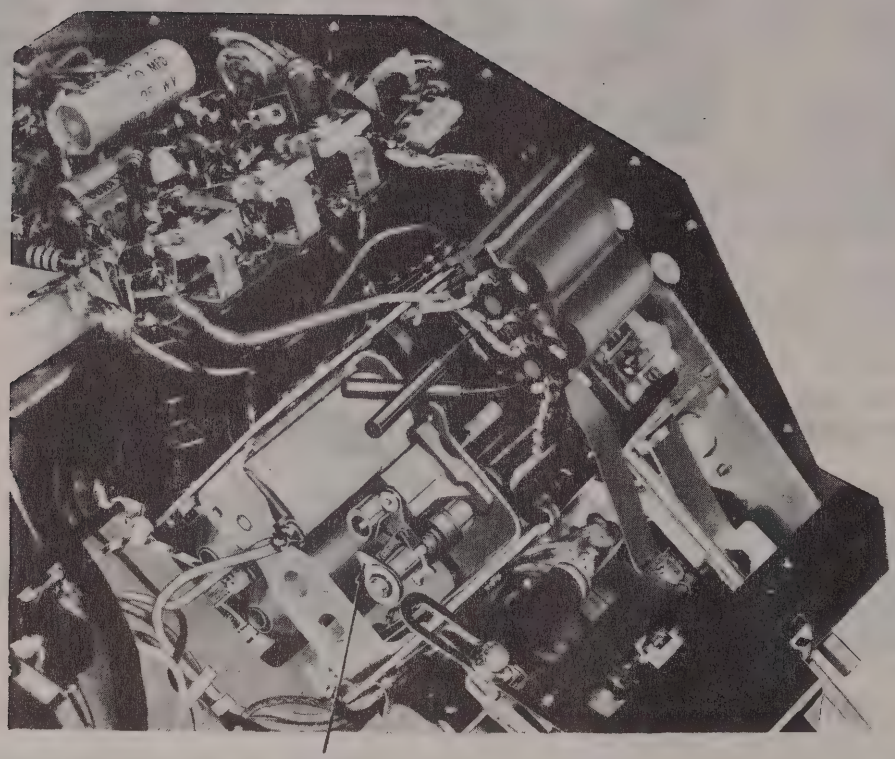
16—Push the solenoid end plug and bracket assembly toward the left of the receiver until it clears the turret shaft.

17—Disconnect one side of the small lever spring. Be careful not to distort or lengthen this spring. The detent and cam levers may not operate properly when the unit is reassembled if this spring is bent or distorted.

18—Remove the long cylindrical brass spacer, indexing disc, spring and short cylindrical spacer. IMPORTANT: Note the position of the teeth before removing the ratchet gear.

19—Replace the racthet gear. Make sure the teeth are in exactly the same position as the original gear. The tuning mechanism and the indicator drum must be on "M" position when replacing the indicator drive gear.

20—Reassemble the tuner unit in reverse order. Replace the front plate, dial scale, automatic push button switch and pilot light bracket.



HOW TO CHANGE THE RATCHET GEAR IN MODEL 7ML080-7ML081

1—Remove the top cover of the receiver.

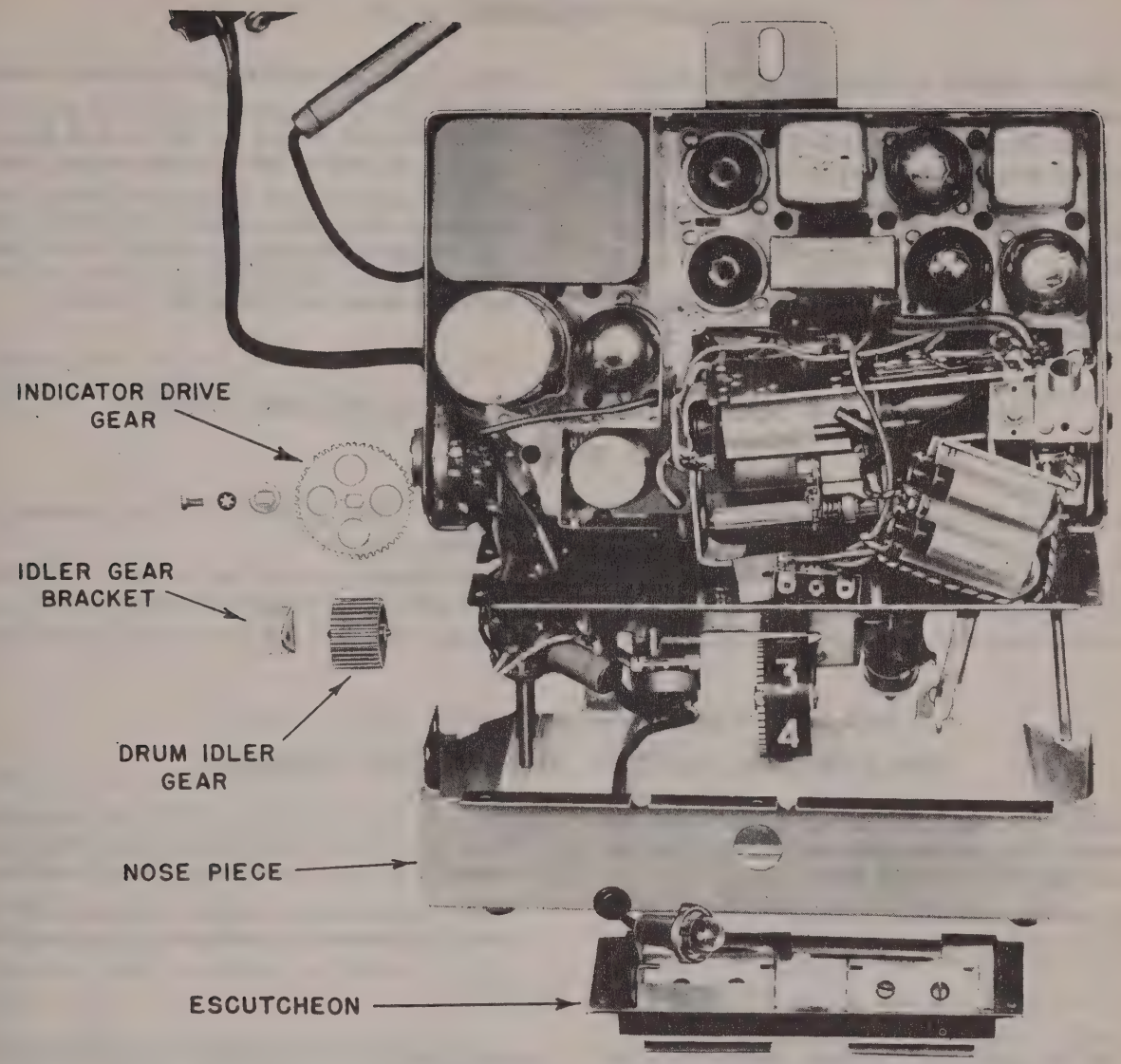
2—Remove the screw, lock washer and flat washer and indicator cam from the turret shaft. This can be accomplished by inserting a small screw driver through a hole in the solenoid end bracket.

3—Disconnect the cam lever spring. Be careful not to stretch or distort this spring. If this spring is distorted the detent and cam levers may not operate properly when tuner is reassembled.

4—Remove the brass cylindrical spacer, indexing disc, brass spacer and spring. IMPORTANT: Note the position of the teeth in the ratchet gear before it is removed.

5—Replace ratchet gear. Make sure the ratchet gear teeth engage exactly the same as the original gear.

6—Reassemble the brass spacer spring, long cylinder spacer, flat washer, etc., to turret shaft. Replace detent spring.



HOW TO CHANGE THE RATCHET GEAR IN MODEL 6MN082

BE SURE THE TUNER IS ON MANUAL. Set Dial at 16.

1—Remove the top and bottom covers. Loosen dial light from the nose piece. Remove 7C5 and 7B6 tubes.

2—Remove the escutcheon from the nose piece.

3—Remove the nose piece from the front plate. Remove dial scale from nose piece.

4—Remove the indicator dial idler gear and bracket. This is necessary to get at the solenoid bracket and plug front assembly screw.

5—Remove the two remaining assembly screws holding the tuner unit to the front plate.

6—Loosen the front plate from the receiver, and pull forward as far as possible.

7—Remove the brass drum indicator drive gear from the turret drive shaft.

8—Remove the rear assembly screw holding the solenoid end plug and bracket assembly to the back plate.

9—Push the solenoid end plug bracket assembly toward the left end of the receiver.

10—Remove the mounting screws from the top tuner coil assembly, and push the coil assembly toward the left end of the receiver until the coils are free of the tuner slug.

11—Disconnect one side of lever spring. Be careful not to distort or lengthen this spring. If the spring is distorted the detent and cam levers may not operate properly when reasssembled.

12—Remove the long brass cylindrical spacer, indexing disc, and ratchet return spring, and short brass spacer. IMPORTANT: Note the position of the teeth before removing the ratchet gear.

13—Replace the ratchet gear. Make sure the teeth are in exactly the same position as the original gear. Also be sure the tuning mechanism and the indicator drum is in the "M" position when replacing the idler gear and bracket.

14—Replace the ratchet gear. Reassemble tuner unit. Replace the front plate, nose piece, dial scale and escutcheon.

CHANGING THE SOLENOID IN MODELS 6MF080, 6MH081 AND 6MN082 AUTO RECEIVERS

1—(a) Nash—Perform operations 1 to 10 inclusive under changing ratchet gear in Model 6MN082.
(b) Ford—Perform operations 1 to 10 inclusive under changing ratchet gear in Model 6MF080.
(c) Hudson—Perform operations 1 to 16 inclusive under changing ratchet gear in Model 6MH081.

2—Unsolder the yellow wires from the solenoid and terminal assembly.

3—Remove the solenoid bracket and plug assembly.

4—Slide solenoid toward the left end of the receiver until free of the solenoid magnet core.

5—Replace solenoid and reassemble tuning unit. Be sure to check the position of the ratchet gear —one tooth engaging the ratchet drive gear. Also make sure the tuning mechanism and the indicator drum are in the "M" position.

CHANGING THE SOLENOID IN MODELS 7ML080 AND 7ML081 AUTO RECEIVERS

1—Remove top cover from the receiver.

2—Set the tuner to manual position and tune set to 16 on the dial.

3—Unsolder the yellow wires from the solenoid.

4—Remove solenoid end plug and bracket assembly.

5—Slide solenoid toward the left end of receiver until free of the solenoid magnet core.

6—Replace solenoid and reassemble tuning unit.

REPLACING THE RATCHET AND BRACKET ASSEMBLY

1 -Loosen the left hand lower tuning coil assembly. Slip the assembly to the left of the set until free of the tuning slugs.

2 -Follow the procedure outlined above for removing the solenoid.

3—Remove the ratchet and bracket assembly, held in place by one screw through the front plate, and one screw through the front plate.

4 -With replacement ratchet and bracket assembly, reassemble the tuner in reverse order.

LUBRICATION

The ratchet gear must engage freely with the ratchet on the turret assembly. It, therefore, must be clean and lubricated with a good grade of clock oil. WARNING: Do not use a heavy grade of lubricant.

The points of friction on the guide rods, dial pointer, solenoid magnet core, and the hub of the station indicator drum must also be lubricated with clock oil.

All other points of friction should be lubricated with Texaco RCX-148 low temperature grease No. 67 or its equivalent.

TROUBLE SHOOTING

Mechanism fails to move from one position to the next or jams tightly between two positions

1—Be sure the "A" battery supply is capable of delivering 5.5 volts at 20 amperes.

2—Check lubrication of ratchet gear and guide rods.

3—Check dial pointer and indicator drum and drive gear assemblies for binding or warped parts.

4—Teeth on ratchet gear are worn or damaged. Replace gear.

5—Lever spring missing from ratchet and bracket assembly. Replace spring.

6—Detent lever or cam lever broken from ratchet and bracket assembly. Replace ratchet and bracket assembly.

Mechanism fails to return all the way to resting position or 16 on the dial when tuned manually

1—Check lubrication of guide rods.

2—Be sure pointer does not rub on dial glass or dial scale.

3—Be sure of proper distance between holes and slot in pointer.

Tuning knob will not remain in the "Out" position when it is pulled out to set up the stations or to tune manually

1—Tuning shaft locking lever bent. Bend lever back to original position. (Fig. 3).

2—Shoulder rivet pulled out. Replace rivet, or replace mounting plate and lever assembly.

Knob fails to return to the "In" position when the push button or foot switch is pressed

1—End broken from lever (Fig. 2). Replace lever or replace complete mounting plate and lever assembly.

Pointer sticks at the low frequency end of dial

1—Tuning knob too close to panel. Will not allow knob to rotate freely when it is in the "IN" position. Loosen knob, and re-fit. Allow approximately ⅛" clearance between knob and panel.

2—Plastic ring loosened from knob (Ford only) allowing same conditions as above. Replace knob.

3—Idler gear or indicator drum binding.

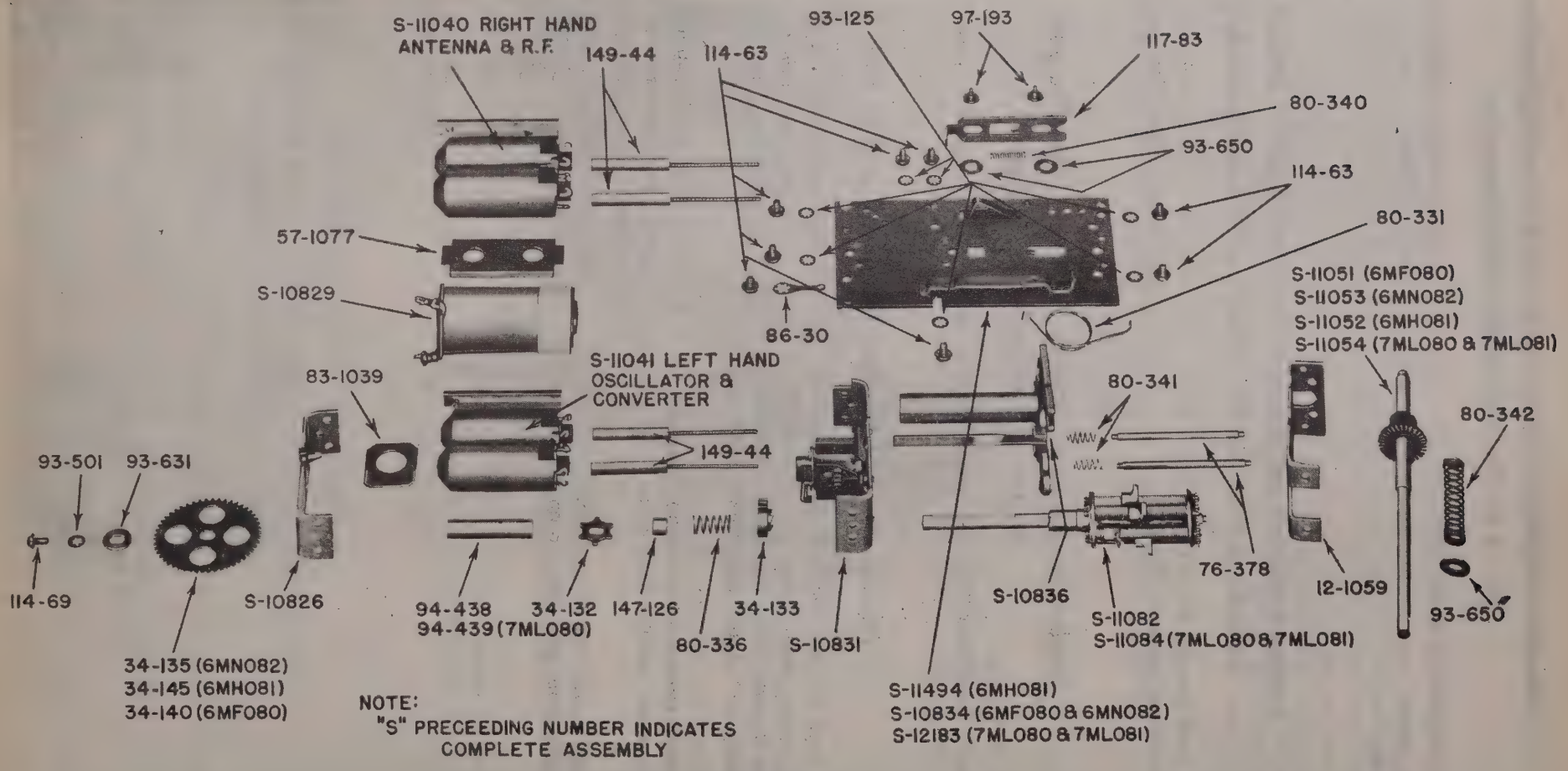
(a) Be sure drum does not rub on escutcheon.

(b) Remove escutcheon and check drive gear and indicator drum to make sure they do not bind against the idler gear or front plate.

4—Cross arm return spring broken. Replace spring. To replace spring, loosen left hand coil and shield assembly and pull loose end of return spring retaining strip upward. This will permit the easy removal of the spring. (Fig. 2.)

NOTE: MOUNTING PLATE AND LEVER ASSEMBLIES S-10834, S-12183 AND S-11494 INCLUDE PARTS NO. 97-193, 117-83, 80-340 AND 93-650. THESE CAN BE PURCHASED SEPARATELY.

NOTE: 6MN082 SAME AS 6MN088.
6MH081 SAME AS 6MH089.



EXPLODED VIEW

PARTS LIST

FORD MODEL 6MF080
(CHASSIS No. 6C80)

"PUSH-PULL" AUTO TUNER COMPONENTS

S-10826	Solenoid End Plug & Bracket Assembly
S-10829	Solenoid & Terminal Assembly
S-10831	Ratchet & Bracket Assembly
S-10834*	Mounting Plate & Lever Assembly
S-10836	Cross Arm Assembly
S-11040	Right Hand Coil & Shield Assembly
S-11041	Left Hand Coil & Shield Assembly
S-11051	Tuning Shaft & Gear Assembly
S-11071	Push-Pull Tuner Assembly (Final)
S-11082	Turret Assembly
34-132	Indexing Disc
34-133	Ratchet Gear
34-140	Indicator Drive Gear
57-1077	Protector Plate
76-378	Guide Rod
80-331	Cross Arm Return Spring
80-332	Cam Lever Spring
80-336	Ratchet Gear Return Spring
80-340	Lever Spring
80-341	Kick-Off Spring
80-342	Tuning Shaft Spring
83-1039	Solenoid Insulating Strip
86-30	No. 6 Shakeproof Terminal
93-125	No. 6 Internal Shakeproof Lockwasher
93-501	No. 4 Internal Shakeproof Lockwasher
93-573	Shoulder Washer
93-631	Retaining Washer
93-650	.010 x 3/16 x 7/16" Brass Washer
94-431	Cross Arm Insulating Bushing
94-438	Cylindrical Spacing Bushing
97-193	Lever Stud
114-63	No. 6-32 x 3/16" Hex. Acorn Hd. Mach Screw, Steel, N.P.
114-69	No. 4-40 x ¼" Hex. Acorn Hd. Mach. Screw, Steel, Cad. Plate
114-150	No. 6-32 x 5/32" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
117-83	Tuning Shaft Locking Lever
147-126	Gear & Disc Spacer
149-44	Adjusting Spring & Core

NASH MODEL 6MN082
(Chassis No. 6C82)

"PUSH-PULL" AUTO TUNER COMPONENTS

S-10826	Solenoid End Plug & Bracket Assembly
S-10829	Solenoid & Terminal Assembly
S-10831	Ratchet & Bracket Assembly
S-10834*	Mounting Plate & Lever Assembly
S-10836	Cross Arm Assembly
S-11040	Right Hand Coil & Shield Assembly
S-11041	Left Hand Coil & Shield Assembly
S-11053	Tuning Shaft & Gear Assembly
S-11073	Push-Pull Tuner Assembly (Complete)
S-11082	Turret Assembly
S-11180	Front Plate & Clamping Strip Assembly
34-132	Indexing Disc
34-133	Ratchet Gear
34-135	Indicator Drive Gear
57-1077	Protector Plate
76-378	Guide Rod
80-331	Cross Arm Return Spring
80-332	Cam Lever Spring
80-336	Ratchet Gear Return Spring
80-340	Lever Spring
80-341	Kick-Off Spring
80-342	Tuning Shaft Spring
83-1039	Solenoid Insulating Strip
86-30	No. 6 Shakeproof Terminal
93-125	No. 6 Internal Shakeproof Lockwasher
93-501	No. 4 Internal Shakeproof Lockwasher,
93-631	Retaining Washer
93-650	Brass Washer
94-431	Cross Arm Insulating Bushing
94-438	Spacing Bushing
97-193	Lever Stud
112-484	No. 6-32 x 3/16" B.H.M.S.
114-63	No. 6-32 x 3/16" Hex. Acorn Hd. M.S.
114-69	No. 4-40 x ¼" Hex Acorn Hd. M.S.
114-150	No. 6-32 x 5/32" Hex. Acorn Hd. M.S.
117-83	Tuning Shaft Locking Lever
147-126	Gear & Disc Spacer
149-44	Adjusting Spring & Core

NOTE: Parts marked * include Parts No. 97-193, 117-83, 80-340, and 93-650. These parts can be purchased separately.

PARTS LIST

LINCOLN MODELS 7ML080 AND 7ML081
(CHASSIS No. 7C80)

"PUSH-PULL" AUTO TUNER COMPONENTS

S-10826	Solenoid End Plug & Bracket Assembly
S-10829	Solenoid & Terminal Assembly
S-10831	Ratchet & Bracket Assembly
S-10836	Cross Arm Assembly
S-11040	Right Hand Coil & Shield Assembly
S-11041	Left Hand Coil & Shield Assembly
S-11054	Tuning Shaft & Gear Assembly
S-11074	Push-Pull Tuner Assembly (Final)
S-11084	Turret Assembly
S-12183*	Mounting Plate & Lever Assembly
34-132	Indexing Disc
34-133	Ratchet Gear
54-34	No. 6-32 x ¼ x 3/32" Hex. Nut, Steel, N.P.
57-1077	Protector Plate
64-146	.088 dia. x 5/32" long Tubular Rivet
64-315	.088 dia. x ⅜" long Tubular Rivet
69-163	No. 4-36 x ⅜" R.H.M.S., Steel, N.P.
76-378	Guide Rod
80-331	Cross Arm Return Spring
80-332	Cam Lever Spring
80-336	Ratchet Gear Return Spring
80-340	Lever Spring
80-341	Kick-Off Spring
80-342	Tuning Shaft Spring
80-429	Indicator Switch Contact Spring
80-430	Indicator Switch Contact Spring
83-1039	Solenoid Insulating Strip
86-30	No. 6 Shakeproof Terminal No. 2101-6
93-125	No. 6 Internal Shakeproof Lockwasher
93-501	No. 4 Internal Shakeproof Lockwasher
93-650	.010 x 3/16 x 7/16" Brass Washer
93-706	.020 x 7/16 x ¾" Neoprene Washer
93-715	Split Insulating Washer
93-748	.018 x .096 x ¼" Washer, Steel, N.P.
94-431	Cross Arm Insulating Bushing
94-439	Cylindrical Spacing Bushing
97-193	Lever Stud
97-220	Pointer Stud
114-48	No. 6-32 x ¼" Hex. Acorn Hd. M.S., Steel, N.P.
114-63	No. 6-32 x 3/16" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
114-69	No. 4-40 x ¼" Hex. Acorn Hd. Mach. Screw, Steel, Cad. Plate
114-150	No. 6-32 x 5/32" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
117-83	Tuning Shaft Locking Lever
128-22	Indicator Cam
147-126	Gear & Disc Spacer
148-45	Cross Arm
149-44	Adjusting Spring & Core

HUDSON MODEL 6MH081
(CHASSIS No. 6C81)

"PUSH-PULL" AUTO TUNER COMPONENTS

S-10826	Solenoid End Plug & Bracket Assembly
S-10829	Solenoid & Terminal Assembly
S-10831	Ratchet & Bracket Assembly
S-10836	Cross Arm Assembly
S-11040	Right Hand Coil & Shield Assembly
S-11041	Left Hand Coil & Shield Assembly
S-11072	Push-Pull Tuner Assembly (Final)
S-11082	Turret Assembly
S-11308	Front Plate & Bushing Assembly
S-11494*	Mounting Plate & Lever Assembly
17-69	Pointer Retaining Clip
34-132	Indexing Disc
34-133	Ratchet Gear
34-145	Indicator Drive Gear
57-1077	Protector Plate
59-158	Pointer
64-146	.088 dia. x 5/32" long — Tubular Rivet
76-378	Guide Rod
80-329	Gear Indexing Spring
80-331	Cross Arm Return Spring
80-332	Cam Lever Spring
80-336	Ratchet Gear Return Spring
80-340	Lever Spring
80-341	Kick-Off Spring
80-342	Tuning Shaft Spring
83-1039	Solenoid Insulating Strip
86-30	No. 6 Shakeproof Terminal Lug
93-125	No. 6 Internal Shakeproof Lockwasher
93-501	No. 4 Internal Shakeproof Lockwasher
93-631	Retaining Washer
93-650	.010 x 3/16 x 7/16" Brass Washer
94-438	Cylindrical Spacing Bushing
94-463	Tuning Shaft Bushing
97-193	Lever Stud
114-63	No. 6-32 x 3/16" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
114-69	No. 4-40 x ¼" Hex. Acorn Hd. Mach. Screw, Steel, Cad. Plate
114-150	No. 6-32 x 5/32" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
114-159	No. 6 x ¼" Hex. Hd. Self Tapping Screw, Steel, Cad. Plate
117-83	Tuning Shaft Locking Lever
147-126	Gear & Disc Spacer
149-44	Adjusting Spring & Core

NOTE: Parts marked * include Parts No. 97-193, 117-83, 80-340 and 93-650. These parts can be purchased separately.

SERVICE MANUAL

ZENITH
LONG DISTANCE AUTO RADIO

Model 5MX080
Crosley Auto Radio

Made for CROSLEY MOTORS by ZENITH RADIO CORPORATION,
Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE: ..... 540-1600 Kc.

INTERMEDIATE FREQUENCY: ..... 265 Kc.

SENSITIVITY: ..... 10 microvolts at one watt output.

UNDISTORTED POWER OUTPUT: .....
2 watts measured at the voice coil.

MAXIMUM POWER OUTPUT: .....
4.25 watts measured at the voice coil.

SPEAKER: ..... 6″ x 9″ oval, instrument panel mounting.

CURRENT CONSUMPTION: ..... 5. amperes

TUBE COMPLEMENT: .....
7Q7 converter, 7B7 I.F., 7C6 detector and 1st audio, 6V6GT Power output, 0Z4 rectifier.

IMPORTANT

The warranty tag must be filled in by the car dealer at time of sale and accompany each receiver to be serviced at established warranty rates during the guarantee period. Otherwise regular charges for labor and material prevail. All repairs, whether in or out of warranty, are for the account of the car dealer or customer. DO NOT send claims to the Zenith Radio Corporation.

PRINTED IN U. S. A.

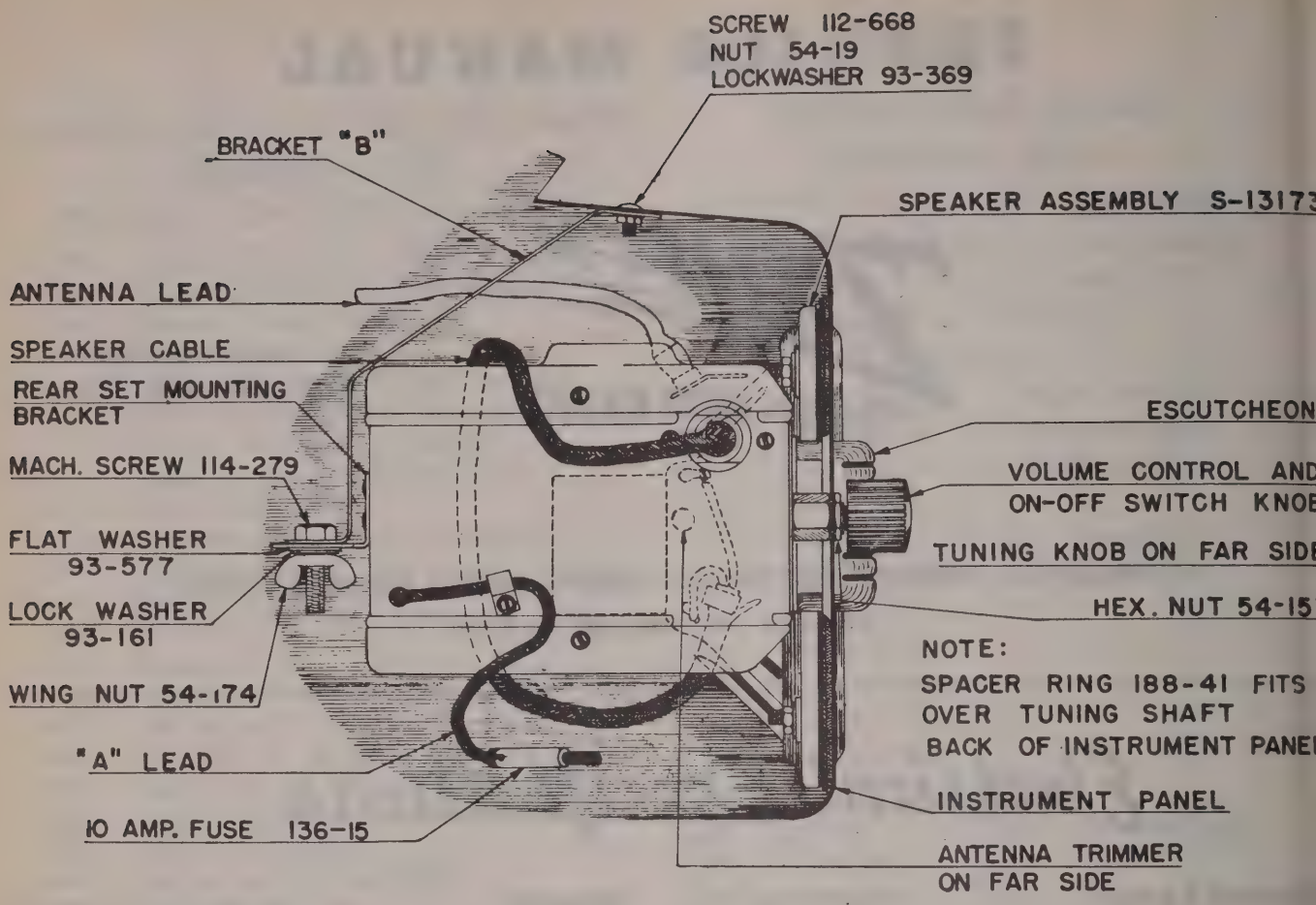


Fig. 1. Installation

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to assist in the removal and reinstallation of this receiver when service is necessary.

To take the receiver from the car, remove the control knobs and mounting nuts from the front panel, and remove the wing-nut, 54-174, lock washer 93-161, flat washer 93-577, and machine screw 114-279 from the set mounting bracket "B."

The speaker is held to the rear of the panel by four hex. nuts.

OFF-ON SWITCH AND VOLUME CONTROL

To turn the receiver on, turn the volume control knob to the right until it clicks and the dial is illuminated. Allow the receiver to reach operating temperature. (Approximately 20 seconds.) To increase the volume, continue to rotate this knob to the right. To turn the receiver off turn the volume control knob to the left until it clicks. (Fig. 2.)

TUNING

Turn the tuning knob (Fig. 1) to tune in the desired station. Tune to the exact frequency to prevent distortion. The pointer in front of the illuminated dial scale indicates the frequency to which the receiver is tuned. (Fig. 2.)

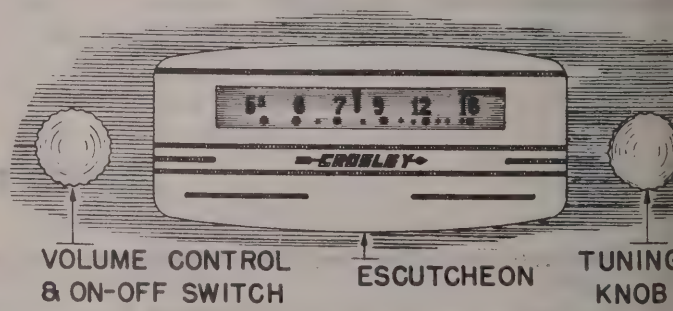


Fig. 2. Front View

INTERFERENCE ELIMINATION

here should be no interference from the ignition system if ne receiver has been installed according to the instructons furnished with it. The interference suppression equipient may be checked for proper installation by referring o the following illustrations:

MPORTANT: Be sure that good contacts are made between ne car frame, or body, and the interference condensers. necessary, clean away paint or dirt with emery paper. e sure all nuts and bolts are tightened securely.

he distributor supressor No. 63-1046 and the flexible round strap No. 83-1335 should be connected as shown n figure 3.

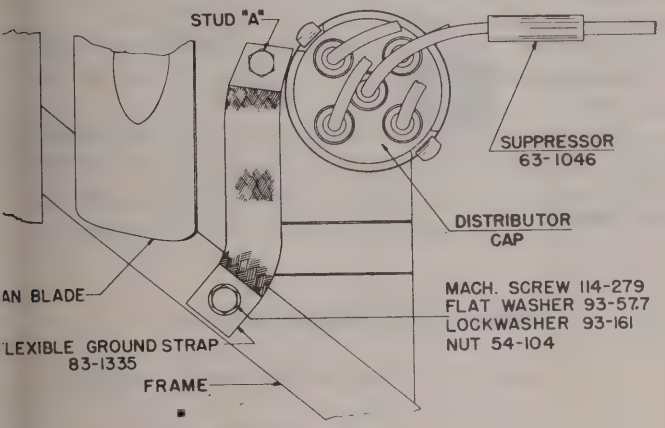


Fig. 3

ne fuel gauge condenser No. 22-919 should be installed s shown in figure 4.

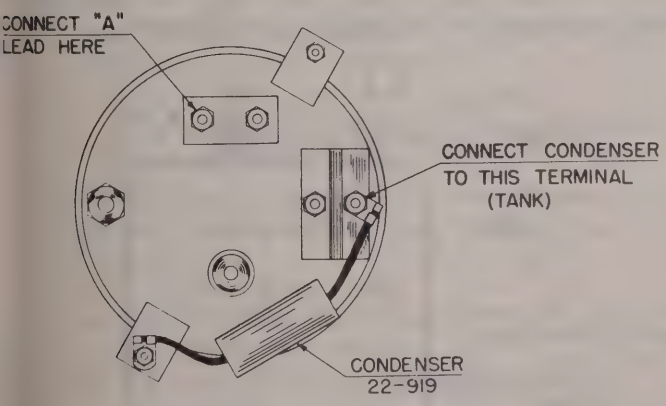


Fig. 4

The generator condenser No. 22-920 should be installed as shown below in figure 5.

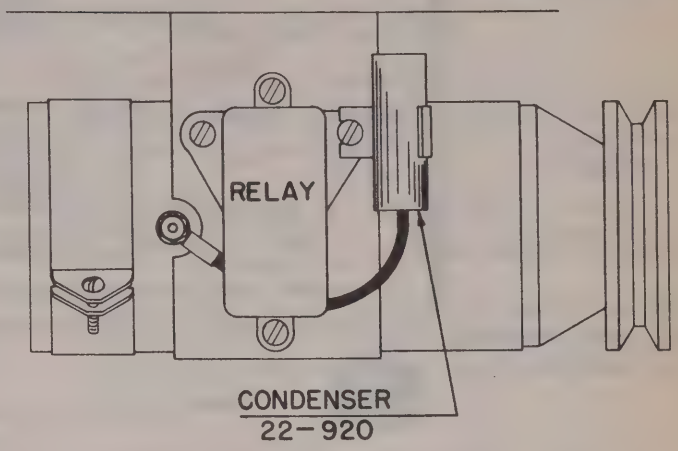


Fig. 5

The motor hood bond spring No. 80-145 should be installed as shown in Figure 6. Note that the sharp extrusions are facing down toward the front of the car before the hood grounding strip is bent back.

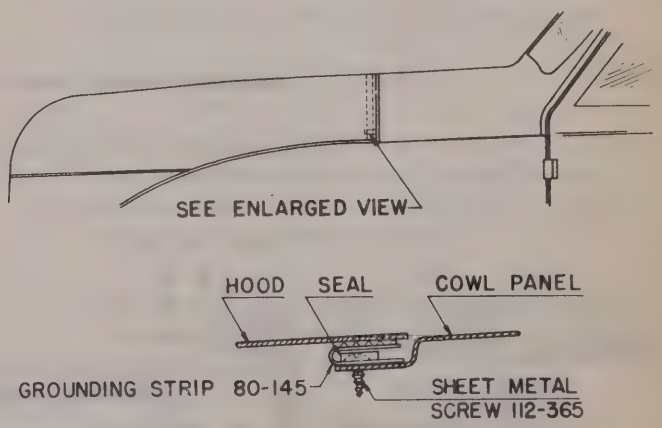


Fig. 6

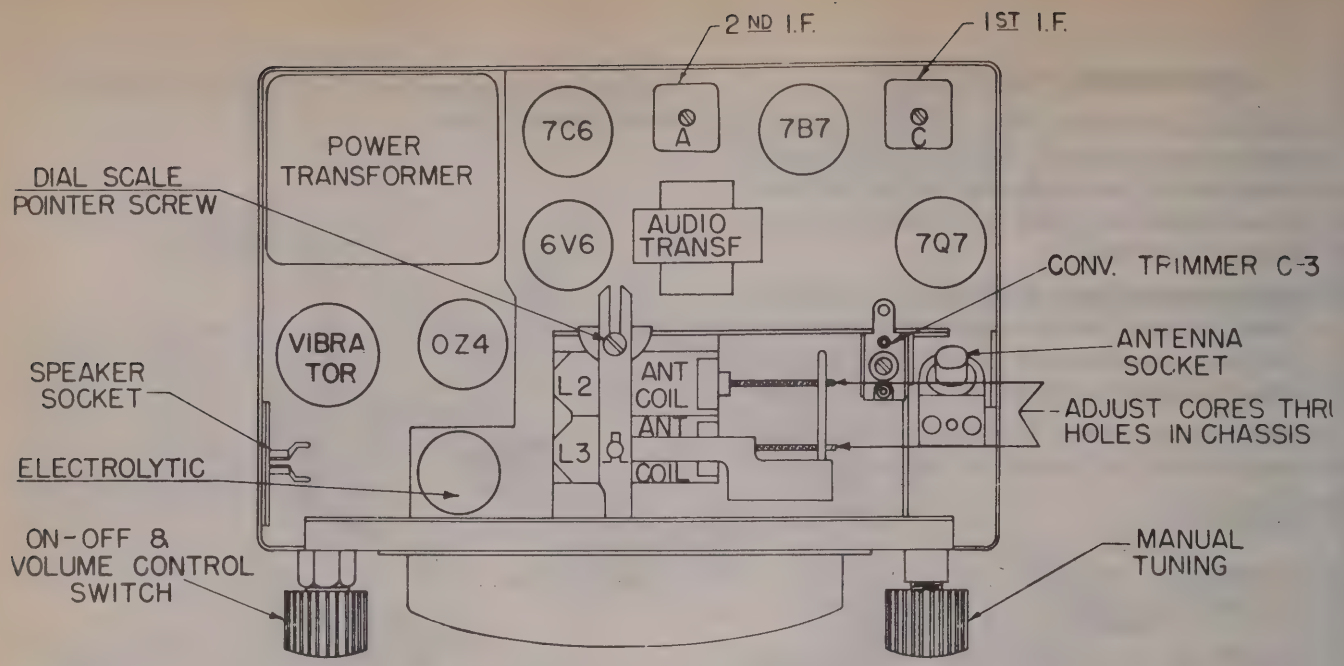


Fig. 7. Top View of Chassis

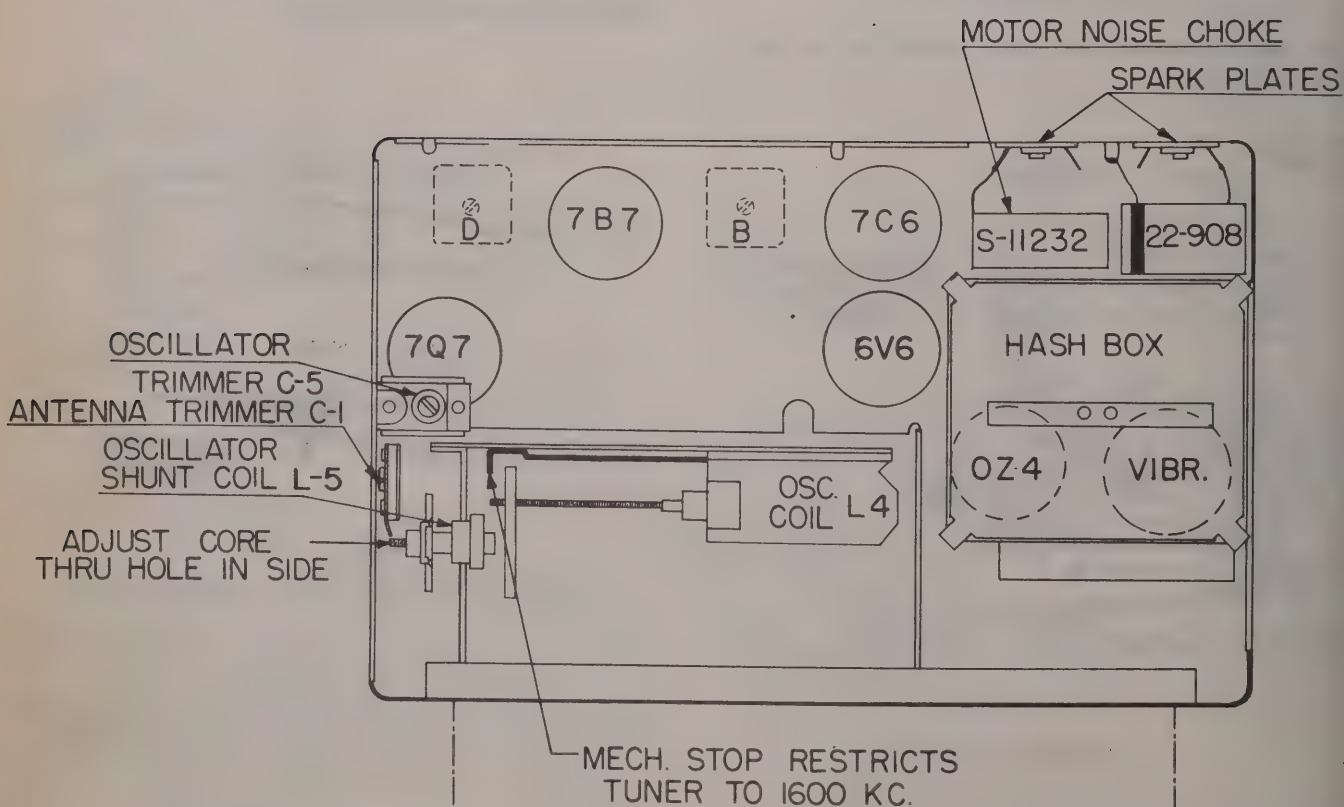


Fig. 8. Bottom View of Chassis

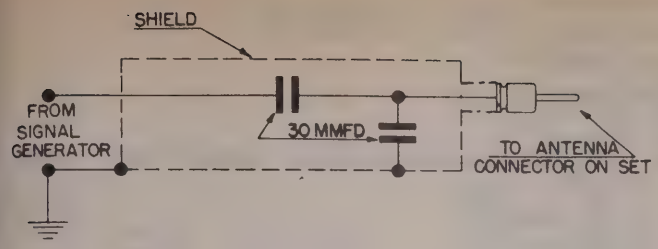


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I. F. ALIGNMENT PROCEDURE

1—Remove top and bottom covers from receiver.

2—Set signal generator to 265 Kc.

3—Apply signal from generator through a .1 Mfd. dummy to 7Q7 converter grid. (Pin No. 6 on socket.)

4—Adjust I.F. slugs A, B, C and D (Figs. 7 and 8), in the order named for maximum output. Repeat the operation to assure accurate alignment.

R. F. AND OSCILLATOR ALIGNMENT

1—Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.

2—Set signal generator to 535 Kc.

3—Set dial to 535 Kc. (End of travel, against the stop.)

4—Adjust oscillator trimmer C-5 (Fig. 8) for maximum response.

5—Set signal generator to 1200 Kc.

6—Tune set to 1200 Kc.

7—Adjust converter trimmer C-3 (Fig. 7) and Ant. trimmer C-1 (Fig. 8) for maximum response.

8—If dial calibration is off after making above adjustments, a correction can be made by turning eccentric screw at fulcrum of dial pointer. (Fig. 7.)

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

1—Replace coil or core.

2—Set signal generator to 1675 Kc.

3—Connect signal generator leads through dummy, illustrated in Figure 9, to antenna receptacle on the receiver. This is important.

4—Set receiver dial to 1600 Kc. (maximum high frequency end of dial.)

5—Break cement loose on all cores and, using the special tuning wrench part No. S-13064, screw the core completely out of the antenna coil, the converter coil, and the oscillator coil.

6—Adjust oscillator trimmer C-5 (Fig. 8) at 1675 Kc.

7—Adjust converter trimmer C-3 and antenna trimmer C-1 (Fig. 7 and 8) for maximum output reading.

8—Replace cores to their approximate original position.

9—Set generator and receiver dial to 1200 Kc.

10—Adjust oscillator core L-4 (Fig. 8) to scale at 1200 Kc.

11—Adjust the two antenna cores L2 and L3 (Fig. 7) for maximum output reading. Do not adjust trimmers.

12—Set signal generator to 600 Kc.

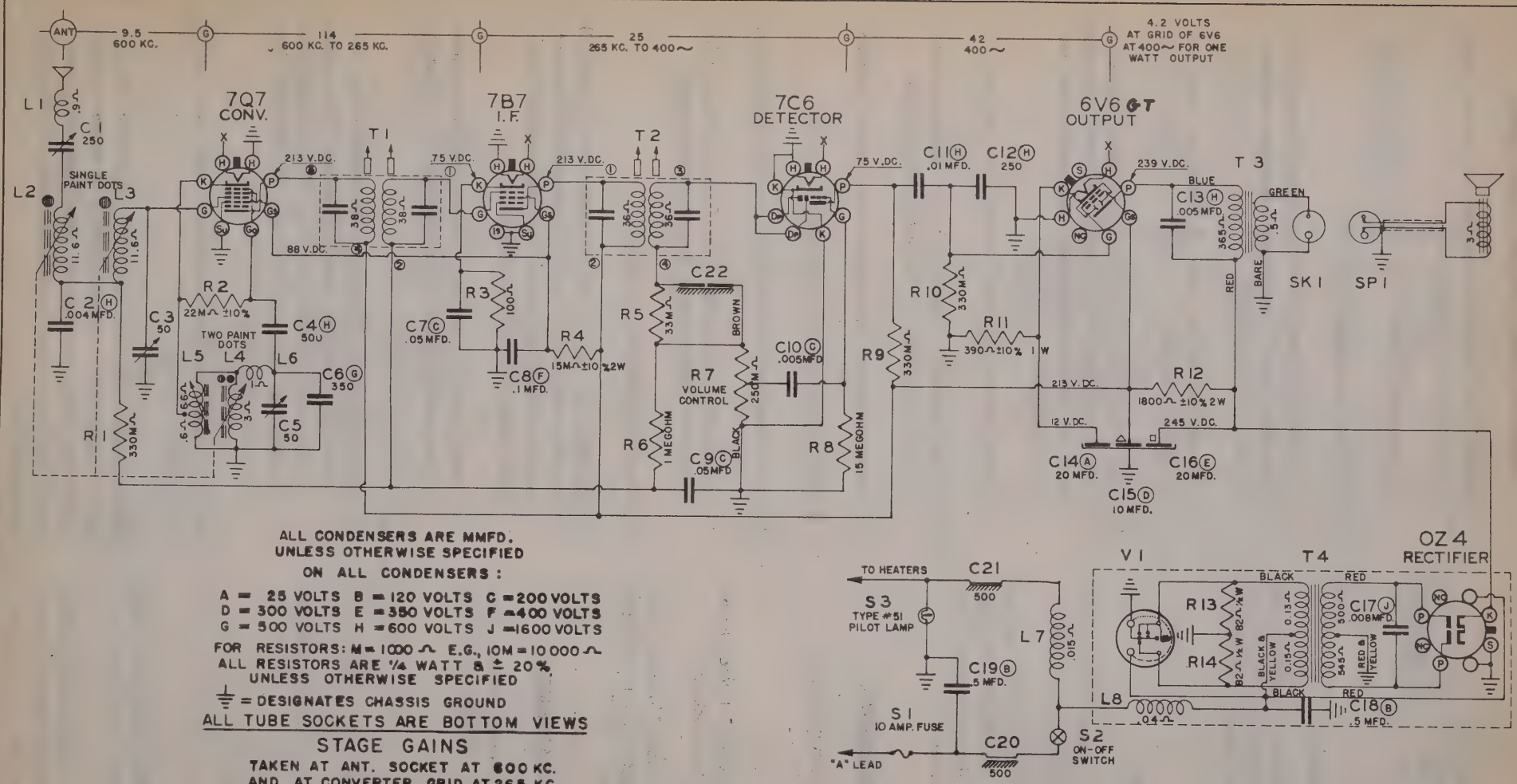
13—If necessary, "rock in" shunt oscillator core L-5 (Fig. 8) for maximum output reading. This should be done only as a last resort, as the core has been set and sealed and should not require adjustment.

14—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.

15—After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station near 1200 Kc.



ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED

ON ALL CONDENSERS :

A = 25 VOLTS B = 120 VOLTS C = 200 VOLTS
D = 300 VOLTS E = 350 VOLTS F = 400 VOLTS
G = 500 VOLTS H = 600 VOLTS J = 1600 VOLTS

FOR RESISTORS: M = 1000 Ω E.G., 10M = 10 000 Ω
ALL RESISTORS ARE 1/4 WATT & ± 20% UNLESS OTHERWISE SPECIFIED

⏚ = DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANT. SOCKET AT 600 KC. AND AT CONVERTER GRID AT 265 KC.

DUMMY ANTENNA

30 MMFD SERIES & 30 MMFD. SHUNT AT ANT. SOCKET & 0.1 MFD. SERIES TO CONVERTER GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOLUME CONTROL SET AT MAXIMUM WITH NO INCOMING SIGNAL

VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

SCHEMATIC DIAGRAM FOR 5 TUBE

CROSLEY 5MX080

I. F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.

ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS
U. S. A.

SCHEMATIC

PARTS LIST CROSLEY AUTOMOTIVE RECEIVER

MODEL 5MX080 (CHASSIS 5C80)

DIAL AND TUNING MECHANISM ASSEMBLY

Diagram No.	Part No.	Description
	26-380	Dial scale
	57-1228	Escutcheon
	59-180	Dial pointer
	80-329	Gear indexing spring
	80-331	Cross arm return spring
	80-379	Pointer retainer spring
S-3	100-32	Dial light bulb
	149-44	Adjusting spring and core (3 used)
	188-45	Turret screw lock ring
	S10826	Solenoid end plug and brkt. assem.
	S12439	Pointer mtg. brkt. and stud assem.
	S12440	Pointer drive brkt. and stud assem.
	S12447	Dial light socket and wire assem.
	S12594	Manual tuner assem. (final)
	S13156	Tuning and vol. con. knob assem. (46-639 red)
	S13161	Tuning shaft and gear assem.
	S13162	Mtg. plate and retaining strip assem.
	S13178	Cross arm assem.
	S13238	Turret assem.

CHOKES AND COILS

L8	20-213	Main hash choke
T1	95-1003	1st I.F. transformer
T2	95-1004	2nd I.F. transformer
L1	S8819	Ant. motor noise choke assem.
	S11040	R. F. coil and shield assem.
L6	S11229	Osc. series coil assem.
L7	S11232	Motor noise choke coil assem.
L4	S12053	Osc. tuning coil assem.
L2, L3	S12060	R. F. coil tuning assem. (2 used)
L5	S13155	Osc. shunt coil assem.
	S13160	Ant. coil and shield assem.

CONDENSERS

C- 8	22-170	.1 mfd.	400 volt
C-12	22-182	250 mmfd.	600 volt
C- 9	22-250	.05 mfd.	200 volt
C- 4	22-716	500 mmfd.	600 volt
C-13	22-838	.005 mfd.	600 volt
C-10	22-906	.005 mfd.	200 volt
C-18, C-19	22-908	.5 mfd.	120 volt
C-11	22-1170	.01 mfd.	600 volt
C-22	22-1076	Dual 250 mmfd.	100 volt
C- 7	22-250	.05 mfd.	200 volt
C- 2	22-1244	.004 mfd.	600 volt
C- 3	22-1376	Detector trimmer	
C- 5	22-1378	Oscillator trimmer	
C-14, C-15, C-16	22-1387	Dry electrolytic—20 mfd.—25 v. x 10 mfd.—300 v. x 20 mfd.—350 volt	
C- 1	22-1420	Antenna trimmer	
C-17	22-1448	.008 mfd.	1600 volt
C- 6	22-1641	350 mmfd.	500 volt

RESISTORS

Diagram No.	Part No.	Description	
R- 4	63-942	15M ohm	2 watt insl.
R-12	63-1368	1800 ohm W.W.	2 watt insl.
R-11	63-1372	390 ohm W.W.	1 watt insl.
R- 6	63-1390	1 megohm	¼ watt insl.
R- 5	63-1391	33M ohm	¼ watt insl.
R- 1, R- 9, R-10	63-1392	330M ohm	¼ watt insl.
R- 2, R-13, R-14	63-1395	22M ohm	¼ watt. insl.
	63-1399	82 ohm	½ watt insl.
R- 8	63-1400	15 megohm	¼ watt insl.
R- 3	63-1414	100 ohm	¼ watt insl.
R- 7	63-1513	Vol. con. and sw.	

MISCELLANEOUS

	52-294	Vol. con. cable
	52-397	Speaker cable and plug
	52-417	Battery cable (set to fuse)
	52-418	Battery cable (fuse to ammeter)
	54-184	Set spacer nut (used on 63-1513)
	78-281	Vibrator socket
	78-596	Loktal base tube socket (8 contact)
	78-684	Octal base tube socket (moulded)
	78-749	Speaker plug socket
	78-756	Loktal base tube socket
	78-758	Octal base tube socket
	93-456	Vibrator cushion washer
T-3	95-915	Output transformer
T-4	95-1002	Power transformer
S-1	136-15	10 amp. fuse (3AG)
V-1	190-20	Vibrator
	202-486	Instruction book
	S11391	Ant. con. socket and brkt. assem.

SPEAKER AND GASKET ASSEMBLY

	S13173	Speaker and gasket assem. (comp.)
SP-1	49-576	6″ x 9″ P.M. speaker
	196-91	Speaker gasket and screen
	208-576	Cone and voice coil assem.

KNOB KIT

S13171	Knob kit (complete)
S13156	Tuning and vol. con. knob assem. (46-639 red)

SET INSTALLATION KIT

S13172	Set installation kit (complete)
12-1293	Set mtg. brkt.
22-919	Fuel gauge cond.
22-920	Generator cond.
54-19	No. 10—32 x ⅜ x 3/16 Thick hex nut
54-104	¼—20 x ½ x 3/16 hex nut (1 used)
54-153	7/16—28 x 19/32 x 120 hex nut (2 used)
54-174	¼—20 wing nut (1 used)
63-1046	Distributor suppressor
80-145	Motor hood bond spring
83-1335	Grounding strip
93-161	¼″ external shakeproof lockwasher
93-369	No. 10 internal shakeproof lockwsh'r
93-577	.062 x 17/64 x ¾ steel washer
112-365	No. 8 x ½ B.H. sheet metal screw
112-668	No. 10—32 x ⅝ B.H.M.S.
114-279	¼—20 x 1 hex hd. M.S.
188-41	Set spacer ring

SERVICE MANUAL

ZENITH

REG. U.S. PAT. OFF.

ADJUST-O-MATIC RADIO

Model
6MF080
Ford Part
51A-18805-A1

Made for FORD by ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE: ..... 540-1600 Kc.

INTERMEDIATE FREQUENCY: ..... 265 Kc.

SENSITIVITY: ..... 6 microvolts at one watt output.

UNDISTORTED POWER OUTPUT: .....
2.5 watts measured at the voice coil.

MAXIMUM POWER OUTPUT: .....
4.5 watts measured at the voice coil.

SPEAKER: ..... 6″ x 9″ oval, instrument panel mounting.

CURRENT CONSUMPTION: ..... 7.5 amperes

INSTANTANEOUS CURRENT COMSUMPTION DURING AUTOMATIC CHANGE CYCLE: ..... 20 amperes

TUBE COMPLEMENT: ..... 7A7 R.F., 7B8 converter, 7A7 I.F., 7B6 detector and 1st audio, 7C5 power output, 7Y4 rectifier.

IMPORTANT

The Warranty Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

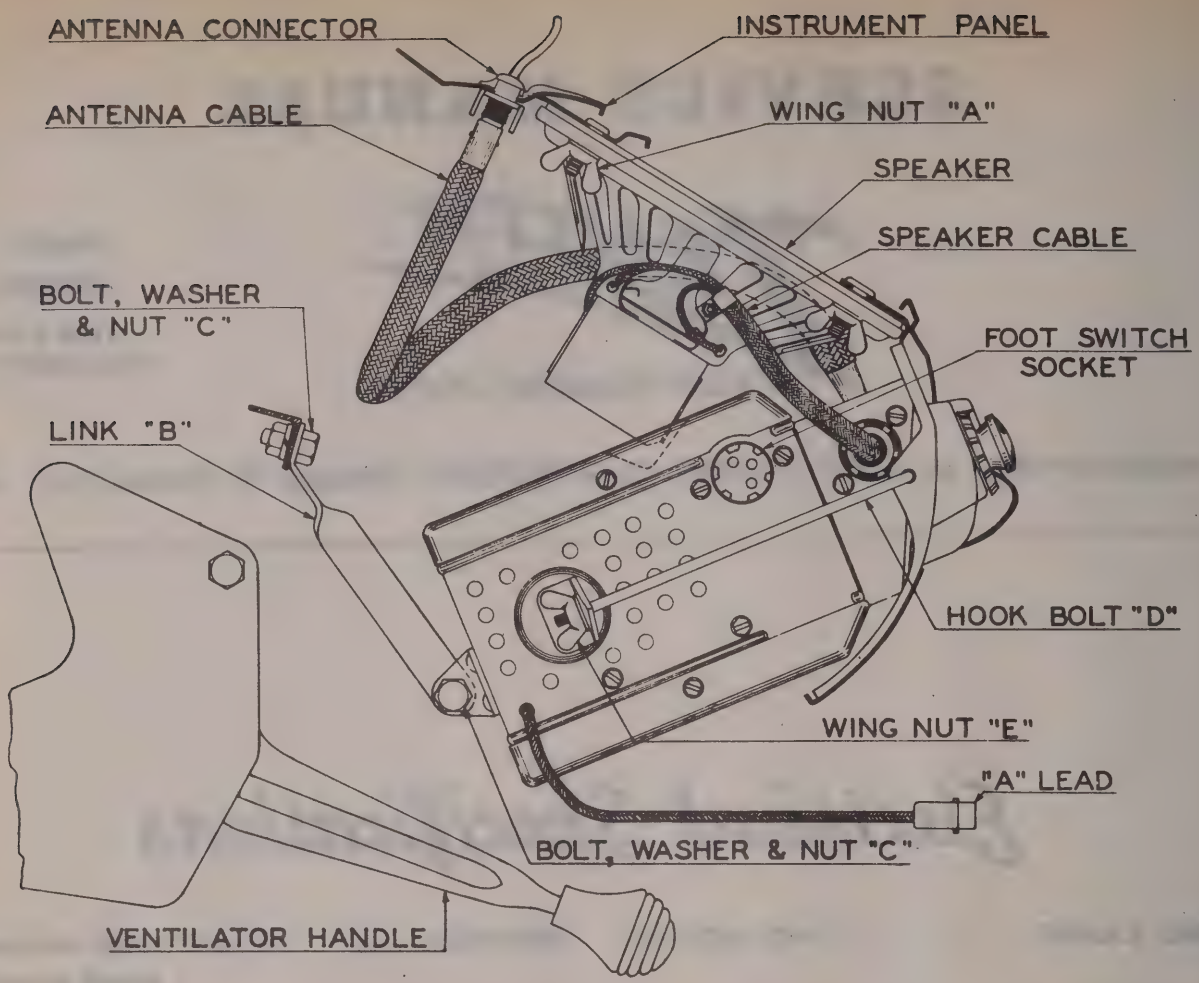


Fig. 1. Set Installed, Cut Away View.

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary. To take the receiver from the car, remove the link "B" and loosen the hook bolts "D."

MANUAL TUNING

1. Press station selector touch bar (Fig. 2) several times or until the letter "M" appears in indicator window.
2. Pull manual tuning control knob (right hand) outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust left hand control knob for desired volume.

TONE CONTROL—The tone control is located behind the volume control knob. Turn in either direction for most pleasing tone.

ADJUST-O-MATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

1. Press station selector touch bar until number 1 appears in station indicator window.

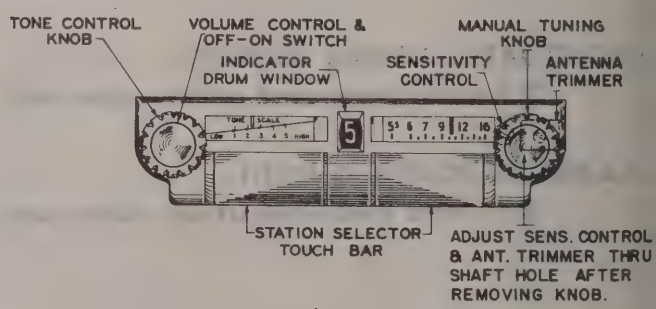

TONE CONTROL KNOB
VOLUME CONTROL & OFF-ON SWITCH
INDICATOR DRUM WINDOW
SENSITIVITY CONTROL
MANUAL TUNING KNOB
ANTENNA TRIMMER
STATION SELECTOR TOUCH BAR
ADJUST SENS. CONTROL & ANT. TRIMMER THRU SHAFT HOLE AFTER REMOVING KNOB.

Fig. 2. Front Panel View

2. Pull manual tuning knob outward to engage the adjust-o-matic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.
4. Press station selector bar, pull manual tuning knob outward and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five adjust-o-matic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the station selector bar to return to dial tuning, or to only one of the stations set up on the Adjust-o-Matic.

DELAYED AUTOMATIC MUTING CIRCUIT

Pressing either the touch-bar or the foot control switch automatically mutes the receiver for the duration of the change cycle. This action is accomplished by applying 6 volts negative to the 7B6 first audio grid through the 1 megohm resistor R-21. (See schematic diagram.) This negative voltage blocks the grid of the 7B6 until the voltage bleeds off through the 15 megohm resistor R-14. Then the receiver will again operate normally.

NOTE: If the battery polarity is reversed the receiver will not mute and it may become distorted during the change cycle. Always connect the positive (+) terminal of the storage battery or power supply to the receiver case when checking the receiver.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition system if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The circuit breaker condenser No. 22-1148 should be installed as shown in Figure 3.

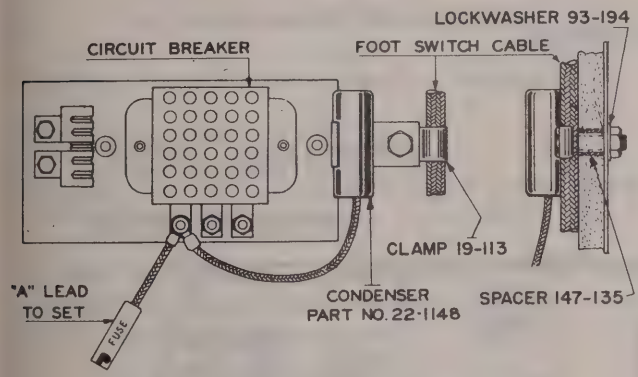


Fig. 3

The voltage regulator condenser No. 22-1148 and the ground strap should be installed as shown in Figure 4 below.

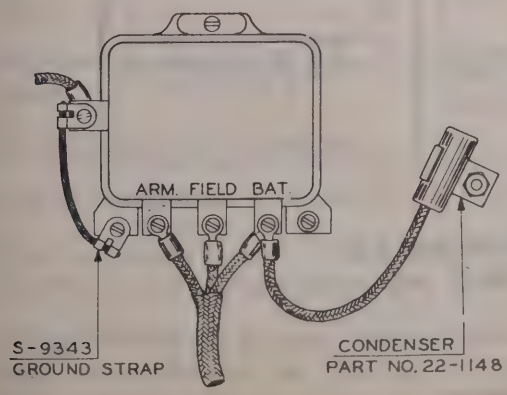


Fig. 4

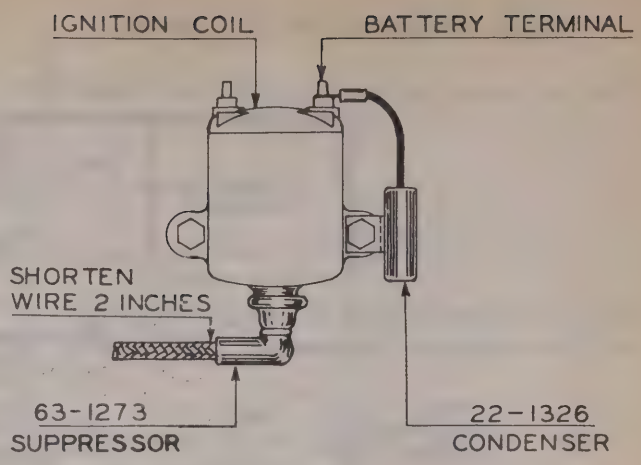


Fig. 5

The ignition coil condenser No. 22-1326 and suppressor with rubber nipple No. S-10408 should be installed as shown above in Figure 5. The oil gauge condenser No. 22-1326 should be installed as shown in Figure 6. Note the different locations for 6 and 8 cylinder cars.

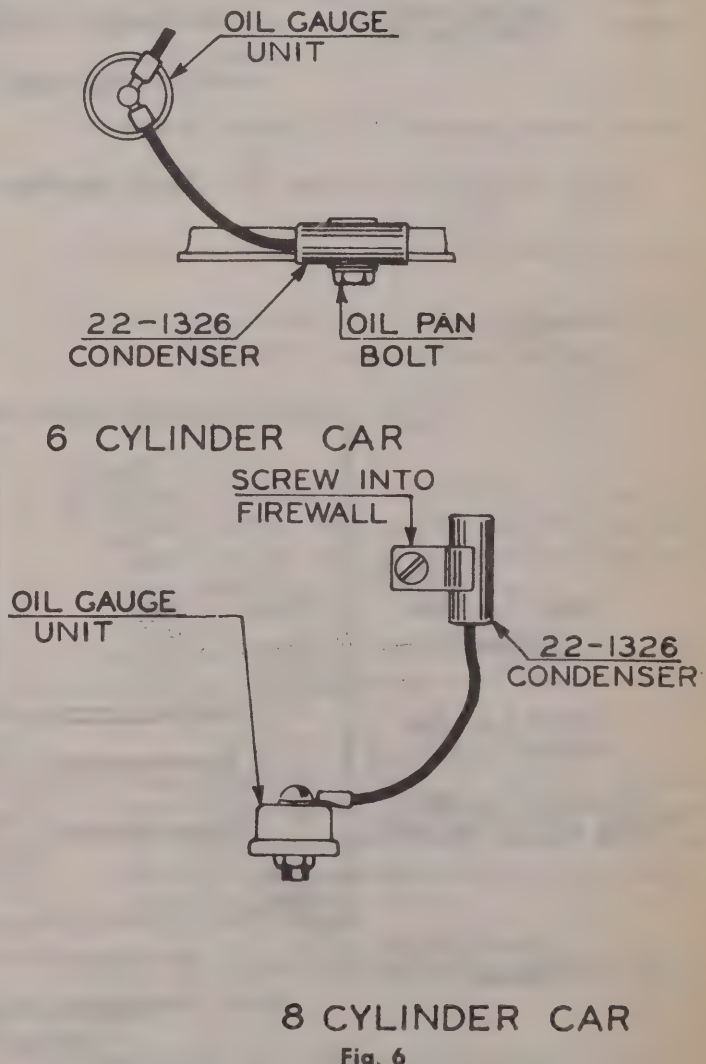


Fig. 6

Be sure the inside windshield divider trim strip, the antenna connector and all the instrument panel bolts are tight in order to make a good ground contact with the car body.

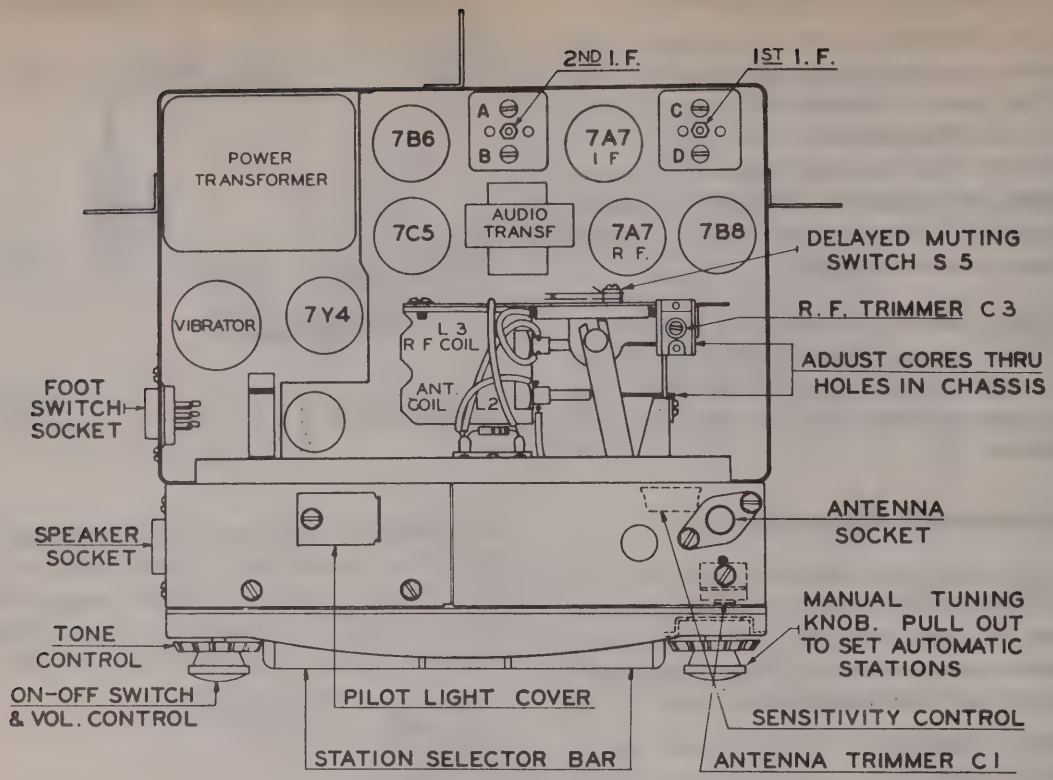


Fig. 7. Top View of Chassis

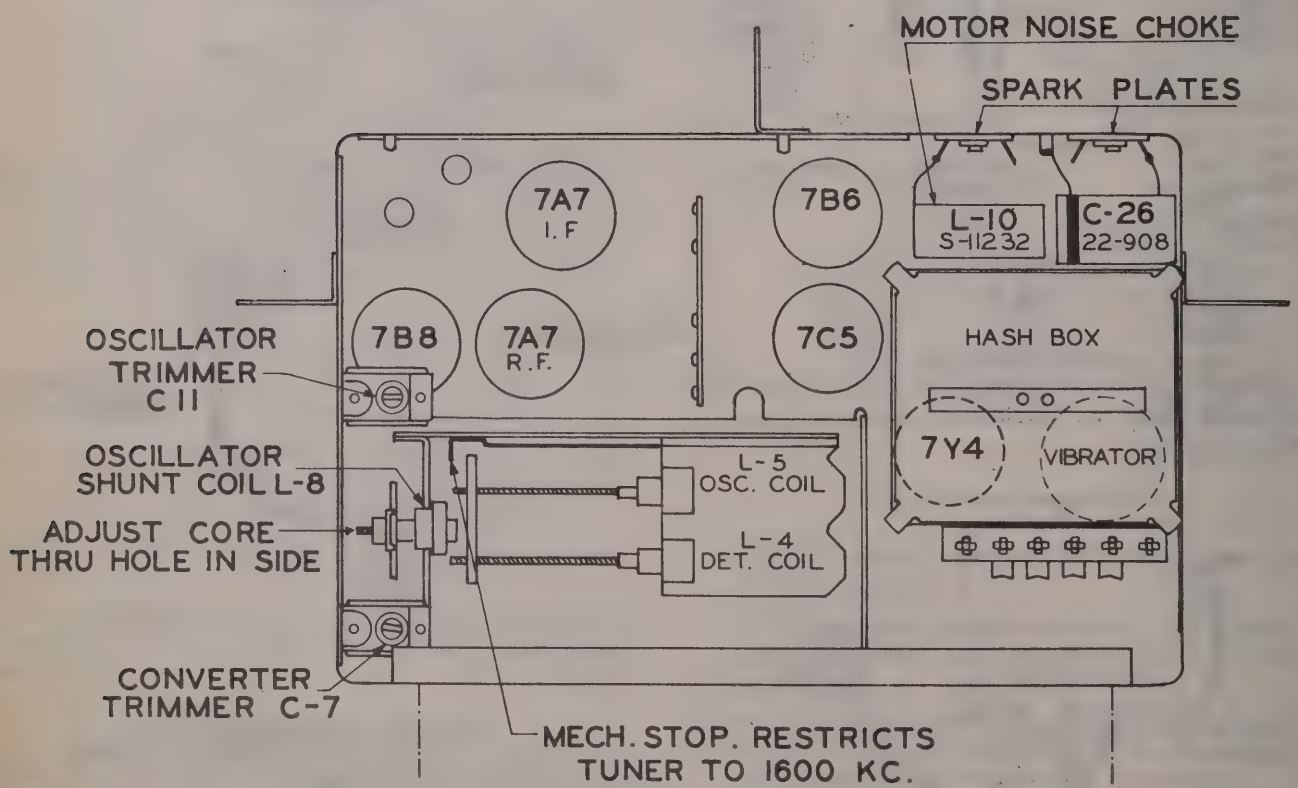


Fig. 8. Bottom View of Chassis

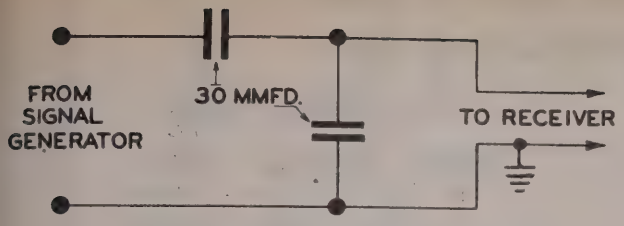


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1—Remove top and bottom covers from receiver.

2—Set signal generator to 265 Kc.

3—Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)

4—Adjust I.F. trimmers A, B, C and D (Fig. 7) in the order named for maximum output. Repeat the operation to assure accurate alignment.

R.F. AND OSCILLATOR ALIGNMENT

1—Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver.

2—Set signal generator to 535 Kc.

3—Place set in manual tuning position and set dial to 535 Kc.

4—Adjust oscillator trimmer C-11 (Fig. 8) for maximum response.

5—Set signal generator to 1200 Kc.

6—Tune set to 1200 Kc.

7—Adjust converter trimmer C-7 (Fig. 8) and R.F. trimmer C-3 (Fig. 7) for maximum response.

8—If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

1—Replace coil or core.

2—Set signal generator to 1700 Kc.

3—Connect signal generator leads through dummy, illustrated in Figure 9, to antenna receptacle on the receiver.

4—Set receiver dial to 1600 Kc. (maximum high frequency end of dial.)

5—Screw the core completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.

6—Adjust oscillator trimmer C-11 (Fig. 8) at 1700 Kc.

7—Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 7 and 8) for maximum output reading.

8—Replace cores to their approximate original position.

9—Set generator dial and receiver dial to 1200 Kc.

10—Adjust oscillator core L-5 (Fig. 8) to scale at 1200 Kc.

11—Adjust the antenna core, R.F. core, and converter core (Fig. 7 and 8) for maximum output reading.

12—Set signal generator to 600 Kc.

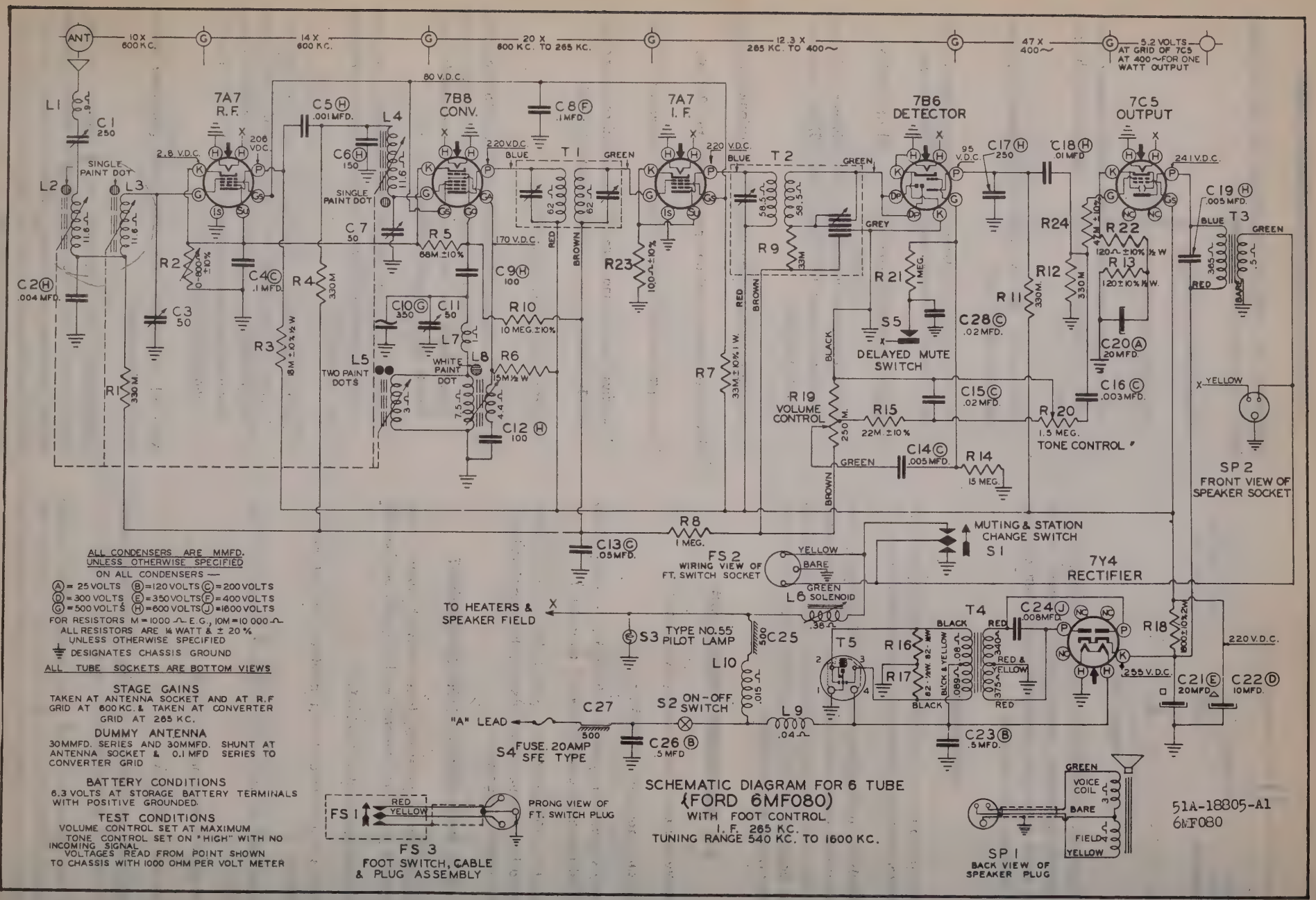
13—"Rock in" shunt oscillator coil L-8 (Fig. 8) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a ganged condenser receiver.

14—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.

15—After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc.


ANT
10 X 600 KC.
14 X 600 KC.
20 X 600 KC. TO 265 KC.
12.3 X 265 KC. TO 400~
47 X 400~
5.2 VOLTS AT GRID OF 7C5 AT 400~ FOR ONE WATT OUTPUT
7A7 R.F.
7B8 CONV.
7A7 I.F.
7B6 DETECTOR
7C5 OUTPUT
80 V.D.C.
220 V.D.C.
170 V.D.C.
95 V.D.C.
241 V.D.C.
255 V.D.C.
2.8 V.D.C.
208 V.D.C.
SINGLE PAINT DOT
TWO PAINT DOTS
WHITE PAINT DOT
DELAYED MUTE SWITCH
VOLUME CONTROL
TONE CONTROL
MUTING & STATION CHANGE SWITCH
S1
7Y4 RECTIFIER
SP2
FRONT VIEW OF SPEAKER SOCKET
FS2
WIRING VIEW OF FT. SWITCH SOCKET
TO HEATERS & SPEAKER FIELD
S3 TYPE NO. 55 PILOT LAMP
S2 ON-OFF SWITCH
S4 FUSE. 20AMP SFE TYPE
"A" LEAD
L6 GREEN SOLENOID
FS1
PRONG VIEW OF FT. SWITCH PLUG
FS3
FOOT SWITCH, CABLE & PLUG ASSEMBLY
SP1
BACK VIEW OF SPEAKER PLUG
VOICE COIL
FIELD
BARE
YELLOW
GREEN
RED
BLACK
BLUE
GREY
BROWN
ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED
ON ALL CONDENSERS —
(A) = 25 VOLTS (B) = 120 VOLTS (C) = 200 VOLTS
(D) = 300 VOLTS (E) = 350 VOLTS (F) = 400 VOLTS
(G) = 500 VOLTS (H) = 600 VOLTS (J) = 1600 VOLTS
FOR RESISTORS M = 1000 Ω E.G., 10M = 10 000 Ω
ALL RESISTORS ARE ½ WATT & ± 20 % UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT R.F GRID AT 600 KC. & TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
30 MMFD. SERIES AND 30 MMFD. SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED.
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM
TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL
VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
SCHEMATIC DIAGRAM FOR 6 TUBE (FORD 6MF080)
WITH FOOT CONTROL
I. F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.
51A-18805-A1
6MF080

PARTS LIST MODEL 6MF080 (CHASSIS 6C80)

1946 FORD ADJUST-O-MATIC 51A-18805-A1

COILS AND CHOKES

Diagram No.	Part No.	Description
L 9	20-213	Main hash choke
T 1	95-916	1st I.F. transformer
T 2	95-942	2nd I.F. transformer
L 1	S8819	Antenna motor noise choke assem.
L 7	S11229	Oscillator series coil assem.
L 8	S11231	Oscillator shunt coil assem.
L10	S11232	Motor noise choke coil assem.
L 2, L 3	S11040	Ant. & R.F. Coil Assem. (Right Hand)
L 4, L 5	S11041	Osc. & Converter Coil Assem. (Left Hand)

Note: In ordering coils marked *, be sure to give color code information.

CONDENSERS

C 9, C12	22-162	100 mmfd.	600 volt
C 8	22-170	.1 mfd.	400 volt
C17	22-182	250 mmfd.	600 volt
C 4	22-190	.1 mfd.	200 volt
C13	22-250	.05 mfd.	200 volt
C19	22-838	.005 mfd.	600 volt
C14	22-906	.005 mfd.	200 volt
C23, C26	22-908	.5 mfd.	120 volt
C 6	22-1137	150 mmfd.	600 volt
C 5	22-1169	.001 mfd.	600 volt
C18	22-1170	.01 mfd.	600 volt
C16	22-1180	.003 mfd.	200 volt
C 2	22-1244	.004 mfd.	600 volt
C15, C28	22-1270	.02 mfd.	200 volt
C 1	22-1375	Antenna trimmer	
C 3	22-1376	R.F. trimmer	
C 7	22-1377	Detector trimmer	
C11	22-1378	Oscillator trimmer	
C20, C21, C22	22-1387	20 MFD. 25 W.V. Electrolytic 20 MFD. 350 W.V. Electrolytic 10 MFD. 300 W.V. Electrolytic	
C24	22-1448	.008 mfd.	1600 volt
C10	22-1478	350 mmfd. compensator	

RESISTORS

Diagram No.	Part No.	Description	
R19, R20, S 2	63-1333	Tone control, vol. control & sw.	
R18	63-1368	1800 ohm 2 watt W.W.	
R 2	63-1379	Sensitivity control	
R 8, R21	63-1390	1 megohm	¼ watt
R 1, R 4, R11, R12	63-1392	330 M ohm	¼ watt
R15	63-1395	22 M ohm	¼ watt
R 5	63-1396	68 M ohm	¼ watt
R 7	63-1398	33 M ohm	1 watt
R16, R17	63-1399	82 ohm	½ watt
R14	63-1400	15 megohm	¼ watt
R 6	63-1401	15 M ohm	½ watt
R22, R13	63-1410	120 ohm	½ watt
R 3	63-1411	1800 ohm	½ watt
R10	63-1413	10 meg.	¼ watt
R23	63-1414	100 ohm	¼ watt
R24	63-1417	47,000 ohm	¼ watt

MISCELLANEOUS

SP1	49-539	6" x 9" dynamic speaker
	52-200	Battery cable (fuse to ammeter)
	52-251	Antenna cable
	52-284	Battery cable (set to fuse)
	78-251	Antenna connector socket
	78-281	Vibrator socket
	78-596	Tube socket—Loktal base (8 cont.)
SP2	78-645	Speaker plug socket
FS2	78-646	Foot switch cable plug socket
	93-456	Vibrator cushion washer
T4	95-914	Power transformer
T3	95-915	Output transformer
S4	136-12	Fuse—20 amp.
	159-54	Plug button
T5	190-20	Vibrator
	196-54	Speaker gasket and screen
	202-374	Instruction book
S1	S11270	Hand selector & muting switch assem.
FS3	S12040	Foot switch, cable & plug assem.

DIAL AND TUNING MECHANISM ASSEMBLY

26-330	Dial scale (manual tuning)
34-132	Indexing disc
34-133	Ratchet gear
34-140	Volume control gear
34-141	Idler gear
46-524	Tone control knob
46-527	Volume control knob
46-528	Selector knob—L.H.
46-583	Selector knob—R.H.
57-1029	Escutcheon
59-151	Dial pointer
59-169	Tone control pointer
73-02	No. 6-32 x 3/16 headless set screw
80-232	Knob retaining spring
80-329	Gear indexing spring
80-331	Cross arm return spring
80-332	Cam lever spring
80-336	Ratchet gear return spring

DIAL AND TUNING MECHANISM ASSEMBLY (Continued)

Diagram No.	Part No.	Description
	80-341	Kick-off spring
	80-342	Tuning shaft spring
	80-343	Solenoid switch spring
	80-344	Solenoid switch contact spring
	80-378	Selector knob spring
	80-379	Pointer return spring
	80-426	Pointer drive tension spring
	80-442	Selector knob spring
S3	100-31	Dial light bulb
	126-481	Dial glass shield
	149-44	Adjusting spring and core
	188-45	Turret screw lock ring
	192-82	Dial glass (2 used)
	S10826	Solenoid end plug & bracket assem.
L6	S10829	Solenoid and terminal assem.
	S10831	Ratchet and bracket assem.
	S10834	Mounting plate & lever assem.
	S10836	Cross arm assem.
	S11031	Dial drum and bracket assem.
	S11033	Tuning & trim knob assem. (46-525 & 526)
	S11051	Tuning shaft and gear assem.
	S11082	Turret assem.
	S11971	Dial light socket & wire assem.
	S11972	Selector knobs, housing & clamp assem.
	S12050	Tone control dial & pulley assem. (26-351)
	S12120	Dial cord and eyelet assem.

MOTOR NOISE SUPPRESSION KIT

Diagram No.	Part No.	Description
	S11278	Motor noise suppression kit complete
	22-1148	Voltage regulater & circuit breaker condenser
	22-1326	Distributor & oil gauge condenser
	54-68	5/16 - 18 x 9/16 x 7/32 hex nut
	63-1273	Distributor suppressor
	93-194	5/16 internal shakeproof lockwasher
	112-323	No. 12 x ½ R.H. S.T. screw
	114-249	5/16 x 18 x 1¾ hex Hd. M.S.
	147-135	Spacer

INSTALLATION PARTS

	S11279	Set installation kit complete
	19-113	Foot switch cable retaining clip
	19-114	Foot switch cable retaining clip
	54-123	No. 10-24 wing nut
	54-157	¼-20 x 7/16 x 3/32 hex nut
	54-189	No. 8-32 wing nut
	93-43	Ground strap
	93-161	¼" ext. shakeproof lockwasher
	112-310	No. 10 x ½ R.H. S.M. screw
	112-360	Set installation screw
	114-175	¼-20 x ½ hex. Hd. M.S.
	118-30	Set installation link used on first 1500 sets only
	118-36	Set installation link

MERCURY
Model
6MM790
Mercury Part
59A-18805-A1

MERCURY EXPORT
Model
6MM790-E
Mercury Part
59AF-18805

SERVICE MANUAL

ZENITH

ADJUST-O-MATIC RADIO

FORD
Model
6MF780
Ford Part
51A-18805-A1

FORD EXPORT
Model
6MF780-E
Ford Part
51AF-18805

Made by ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....4 microvolts at one watt output.

UNDISTORTED POWER OUTPUT:.....
2 watts measured at the voice coil.

MAXIMUM POWER OUTPUT:.....
4.5 watts measured at the voice coil.

SPEAKER:.....6" x 9" oval, instrument panel mounting.

CURRENT CONSUMPTION:.....6 amperes

INSTANTANEOUS CURRENT CONSUMPTION DURING AUTOMATIC CHANGE CYCLE:.....18.5 amperes

TUBE COMPLEMENT:.....7A7 R.F., 7B8 converter, 7A7 I.F., 7B6 detector and 1st audio, 7C5 power output, 7Y4 rectifier.

IMPORTANT

The Warranty Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

Printed in U.S.A. 5M 4 15 47

Form F47

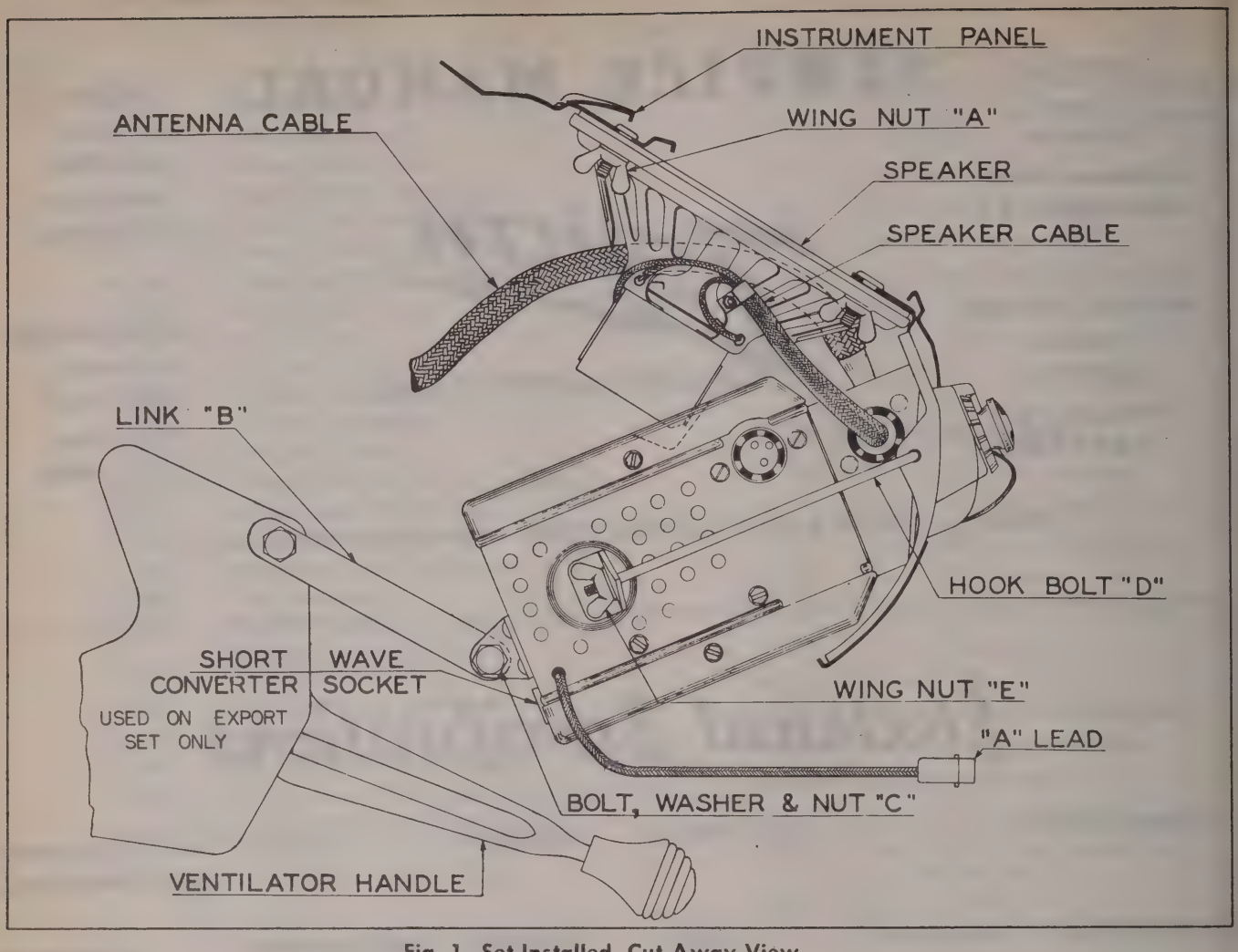


Fig. 1. Set Installed, Cut Away View.

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary. To take the receiver from the car, remove the link "B" and loosen the hook bolts "D."

MANUAL TUNING

1. Press station selector touch bar (Fig. 2) several times or until the letter "M" appears in indicator window.
2. Pull manual tuning control knob (right hand) outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust left hand control knob for desired volume.

TONE CONTROL—The tone control is located behind the volume control knob. Turn in either direction for most pleasing tone.

ADJUST-O-MATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

1. Press station selector touch bar until number 1 appears in station indicator window.

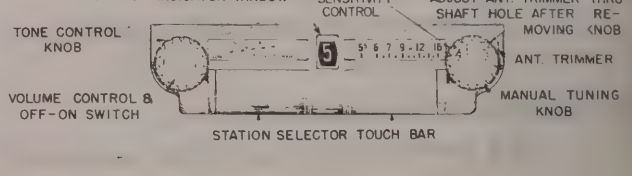


Fig. 2. Front Panel View

2. Pull manual tuning knob outward to engage the Adjust-o-Matic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.
4. Press station selector bar, pull manual tuning knob outward and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five adjust-o-matic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the station selector bar to return to manual tuning, or to any one of the stations set up on the Adjust-o-Matic.

DELAYED AUTOMATIC MUTING CIRCUIT

Pressing the touch-bar automatically mutes the receiver for the duration of the change cycle. This action is accomplished by applying 6 volts negative to the 7B6 first audio grid through the 1 megohm resistor R-21. (See schematic diagram.) This negative voltage blocks the grid of the 7B6 until the voltage bleeds off through the 15 megohm resistor R-13. Then the receiver will again operate normally.

NOTE: Delayed automatic muting circuit was omitted from sets, serial numbers ZF 185392 to ZF 240216 inclusive.

If the battery polarity is reversed the receiver will not mute and it may become distorted during the change cycle. Always connect the positive (+) terminal of the storage battery or power supply to the receiver case when checking the receiver.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The circuit breaker condenser No. 22-1148 should be installed as shown in figure 3 (Export only.)

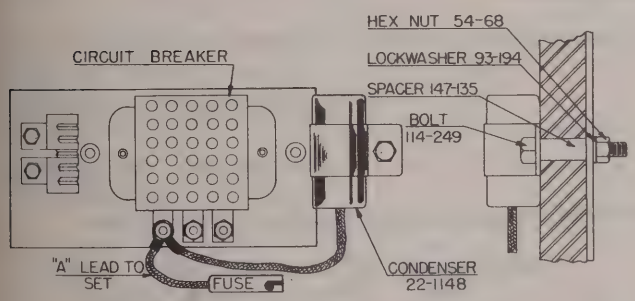
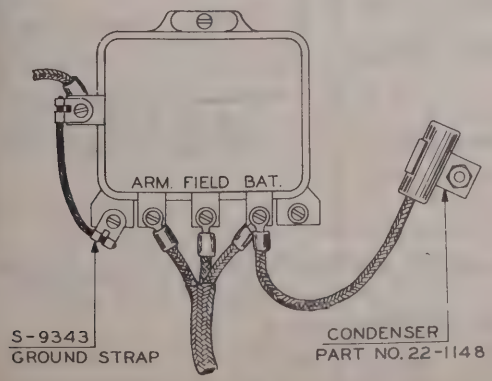


Fig. 3

The voltage regulator condenser No. 22-1148 and the ground strap should be installed as shown in figure 4 below.



CONDENSER ON VOLT. REGULATOR

Fig. 4

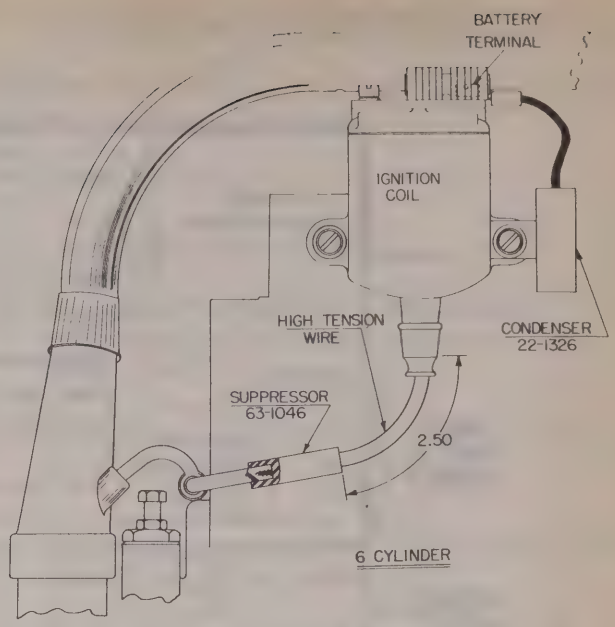


Fig. 5

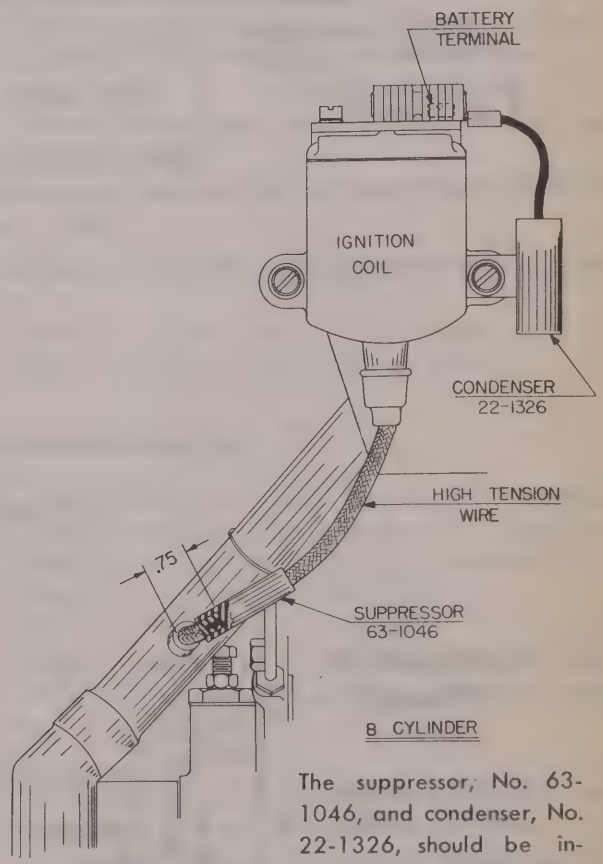


Fig. 6

The suppressor, No. 63-1046, and condenser, No. 22-1326, should be installed as shown in figure 5, for six cylinder cars, or as shown in figure 6, for eight cylinder cars.

If ignition interference is still present, check to make sure that the inside center windshield trim strip is grounded to the car body, and does not touch the antenna roof tube nut. Be certain the antenna wing nut and all the instrument panel bolts are tight.

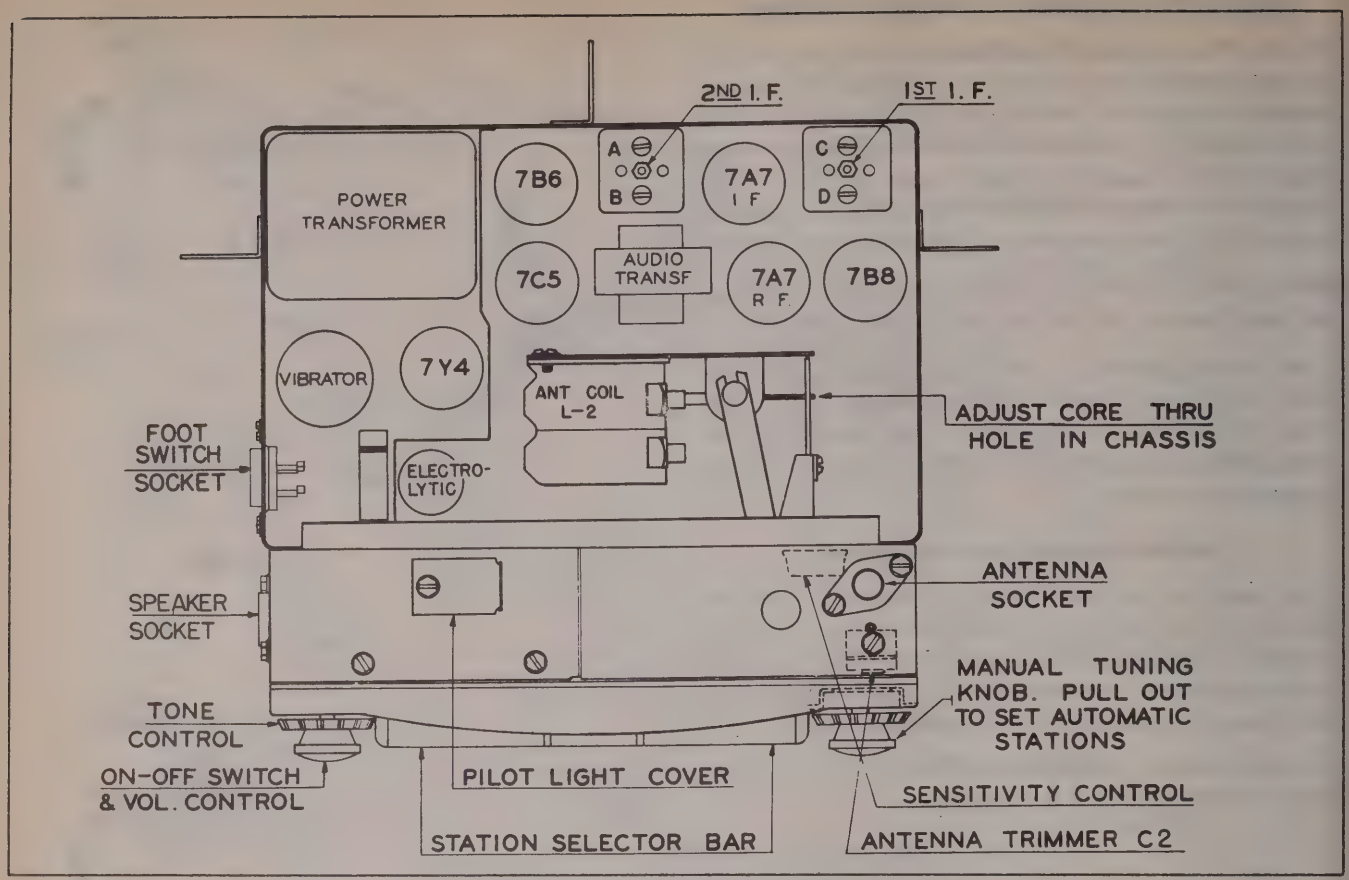


Fig. 7. Top View of Chassis

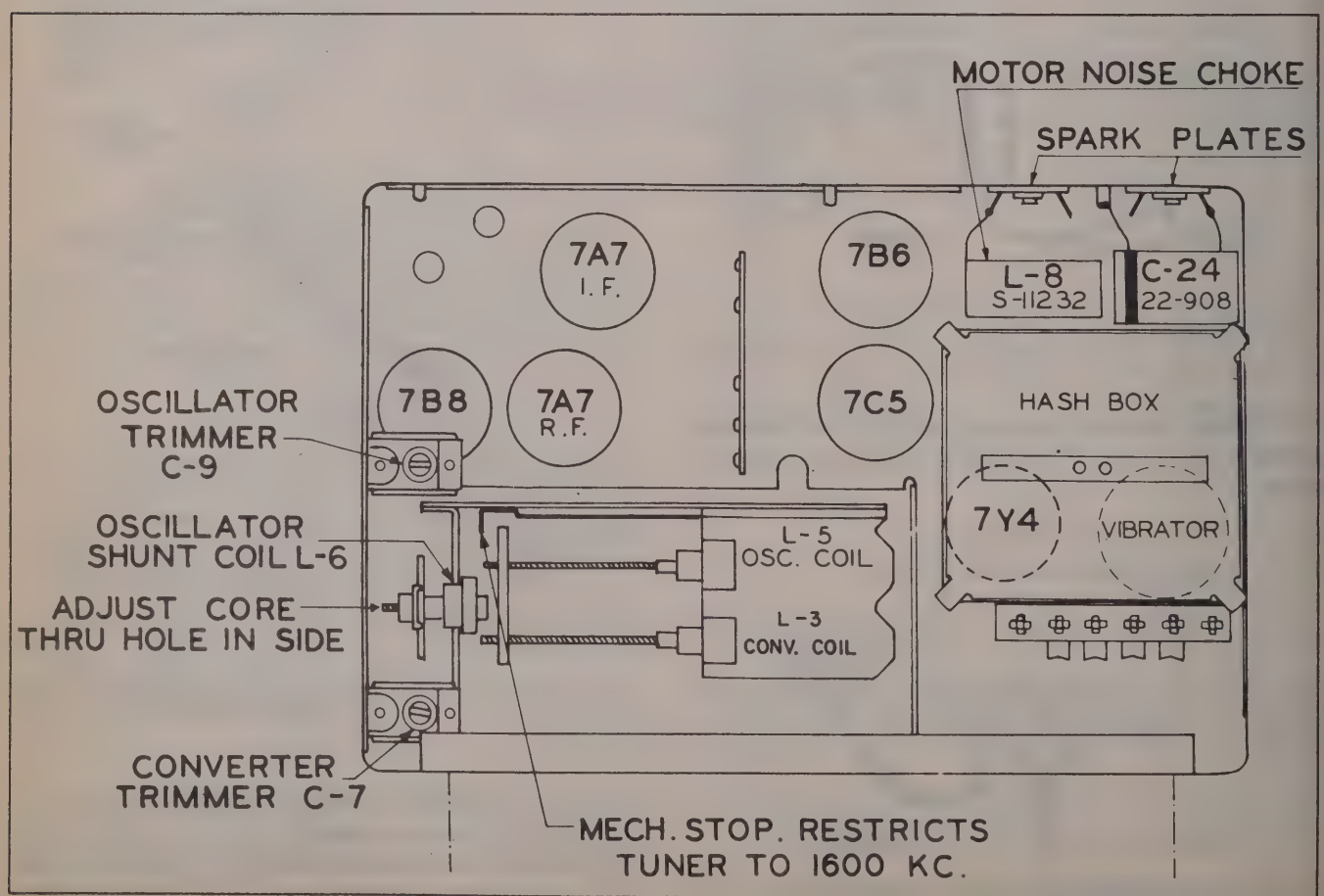


Fig. 8. Bottom View of Chassis

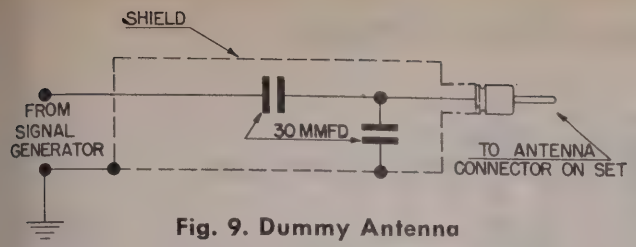


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I. F. ALIGNMENT PROCEDURE

1—Remove top and bottom covers from receiver.

2—Set signal generator to 265 Kc.

3—Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)

4—Adjust I.F. trimmers, A, B, C and D (Fig. 7) in the order named for maximum output. Repeat the operation to assure accurate alignment.

R. F. AND OSCILLATOR ALIGNMENT

1—Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.

2—Set signal generator to 535 Kc.

3—Place set in manual tuning position and set dial to 535 Kc.

4—Adjust oscillator trimmer C-9 (Fig. 8) for maximum response.

5—Set signal generator to 1200 Kc.

6—Tune set to 1200 Kc.

7—Adjust converter trimmer C-7 (Fig. 8) and antenna trimmer C-2 (Fig. 7) for maximum response.

8—If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

1—Replace coil or core.

2—Set signal generator to 1700 Kc.

3—Connect signal generator leads through dummy, illustrated in figure 9, to antenna receptacle on the receiver.

4—Set receiver dial to 1600 Kc. (maximum high frequency end of dial.)

5—Screw the core completely out of the antenna coil, the converter coil, and the oscillator coil.

6—Adjust oscillator trimmer C-9 (Fig. 8) at 1700 Kc.

7—Adjust converter trimmer C-7, and antenna trimmer C-2 (Fig. 7 and 8) for maximum output reading.

8—Replace cores to their approximate original position.

9—Set signal generator dial and receiver dial to 1200 Kc.

10—Adjust oscillator core L-5 (Fig. 8) to scale at 1200 Kc.

11—Adjust the antenna core L-2, and converter core L-3 (Fig. 7 and 8) for maximum output reading.

12—Set signal generator to 600 Kc.

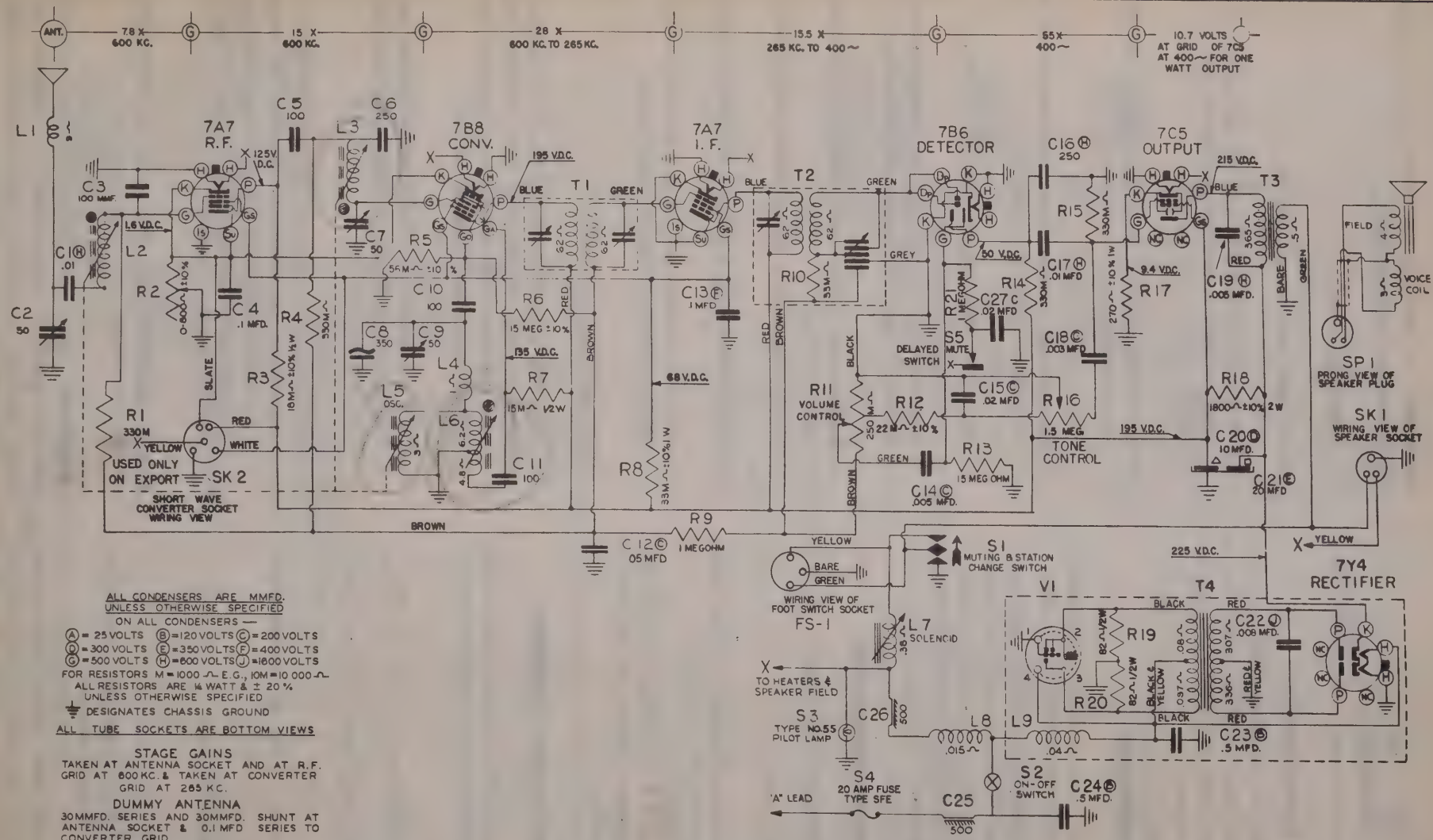
13—"Rock in" shunt oscillator coil L-6 (Fig. 8) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a ganged condenser receiver.

14—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.

15—After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc.



ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED

ON ALL CONDENSERS —

(A) = 25 VOLTS (B) = 120 VOLTS (C) = 200 VOLTS
(D) = 300 VOLTS (E) = 350 VOLTS (F) = 400 VOLTS
(G) = 500 VOLTS (H) = 600 VOLTS (J) = 1600 VOLTS

FOR RESISTORS M = 1000 Ω E.G., 10M = 10 000 Ω
ALL RESISTORS ARE ½ WATT & ± 20 % UNLESS OTHERWISE SPECIFIED

⏚ DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANTENNA SOCKET AND AT R.F. GRID AT 600 KC. & TAKEN AT CONVERTER GRID AT 265 KC.

DUMMY ANTENNA

30 MMFD. SERIES AND 30 MMFD. SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOLUME CONTROL SET AT MAXIMUM
TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL
VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

SCHEMATIC DIAGRAM

I. F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.

PARTS LIST MODEL 6MF780 (CHASSIS 6D80)

COILS AND CHOKES

Diagram No.	Part No.	Description	Price
L9	20-213	Main Hash Choke Coil	$.35
T1	95-916	1st I.F. Transformer	1.75
T2	95-942	2nd I.F. Transformer	2.05
L1	S-8819	Antenna Motor Noise Choke Assembly	.26
L5 L3	S-11041	Oscillator, Converter Coil & Shield Assembly (LeftHand)	2.09
L4	S-11229	Oscillator Series Coil Assembly	.30
L8	S-11232	Motor Noise Choke Coil Assembly	.22
L6	S-13646	Oscillator Shunt Coil Assembly	1.80
L2	S-13650	R.F. Coil & Shield Assembly (Right Hand)	1.50

CONDENSERS

C5 C10 C11	22-162	100 Mmfd.	600 V	.20
C13	22-170	.1 Mfd.	400 V	.26
C16	22-182	250 Mmfd.	600 V	.26
C4	22-190	.1 Mfd.	200 V	.23
C12	22-250	.05 Mfd.	200 V	.20
C3	22-365	100 Mmfd.	500 V	.20
C19	22-838	.005 Mfd.	600 V	.20
C14	22-906	.005 Mfd.	200 V	.20
C23 & C24	22-908	.5 Mfd.	120 V	.23
C6	22-1136	250 Mmfd.	500 V	.20
C1 & C17	22-1170	.01 Mfd.	600 V	.20
C18	22-1180	.003 Mfd.	200 V	.20
C15–C27	22-1270	.02 Mfd.	200 V	.20
C7	22-1377	Detector Trimmer		.33
C9	22-1378	Oscillator Trimmer		.32
C22	22-1448	.008 Mfd.	1600 V	1.00
C8	22-1478	350 Mmfd. Compensator		.32
C20–C21	22-1554	Two Section Electrolytic—10 Mfd. 300 V. x 20 Mfd.—350 V		1.38
	22-1643	Antenna Trimmer		.45
C20–C21	22-1644	20 Mfd. 350 W. V.—10 Mfd. 300 W.V. Electrolytic		1.38

RESISTORS

Diagram No.	Part No.	Description	Price
R11 R16 S2	63-1333	Tone Control, Volume Control & Switch	3.01
R18	63-1368	1800 Ohm, W.W. Insul., 2 W	.33
R17	63-1369	270 Ohm, W.W. Insul., 1 W.	.22
R2	63-1379	Sensitivity Control (or 63-1267)	.35
R9	63-1390	1 Megohm, Insul., ¼ Watt	.19
R1, R4, R14, R15	63-1392	330,000 Ohm, Insul., ¼ Watt.	.19
R12	63-1395	22,000 Ohm, Insul., ¼ Watt.	.19
R8	63-1398	33,000 Ohm, Insul., 1 Watt	.24
R19–R20	63-1399	82 Ohm, Insul., ½ Watt	.21
R13	63-1400	15 Megohm, Insul., ¼ Watt	.19
R7	63-1401	15,000 Ohm, Insul., ½ Watt.	.21
R6	63-1406	15 Megohm, Insul., ¼ Watt.	$.19
R3	63-1411	18,000 Ohm, Insul., ½ Watt.	.21
R5	63-1431	56,000 Ohm, Insul., ¼ Watt.	.19

MISCELLANEOUS

Diagram No.	Part No.	Description	Price
	19-87	Cable Retaining Clip	.01
	49-539	6" x 9" Dynamic Speaker & Cable (S-11277)	7.75
SP1	49-574	6" x 9" P.M. Speaker & Cable (S-13128)	7.75
	52-200	Battery Cable (Fuse to Ammeter)	.24
	52-284	Battery Cable (Set to Fuse)	.23
	52-294	Volume Control Cable	.85
	78-251	Antenna Connector Socket	.12
	78-281	Vibrator Socket (or 78-732-733)	.12
	78-596	Loktal Base Tube Socket (or 78-717-726-729-730-756-762)	.18
FS1	78-646	Foot Switch Socket (or 78-406)	.21
SK1	78-728	Speaker Plug Socket	.18
	83-1076	Single Lug Terminal Strip	.05
	83-1125	Two Lug Terminal Strip	.06
T4	95-1023	Power Transformer (or 95-1024	7.00
T3	95-1026	Output Transformer	2.50
S4	136-12	20 Amp. Fuse Type SFE	.12
V1	190-20	Vibrator	3.85
	196-54	Speaker Gasket & Screen	.78
	202-523	Instruction Book	.04
S1	S-11270	Hand Selector & Muting Sw. Assem.	.67

MOTOR NOISE SUPPRESSION KIT

S-13742	Motor Noise Suppression Kit (Complete)	2.50
22-1148	Voltage Regulator Capacitor	.64
22-1326	Distributor Capacitor	.58
63-1046	Distributor Suppressor	.31
114-249	5/16–18 x 1¾" Hex. Hd. M.S. Steel	.03
S-9343	Regulator Ground Lead Assembly	.07

INSTALLATION PARTS

S-11279	Set Installation Kit (Complete)	.47
54-123	No. 10–24 Wing Nut	.03
54-157	¼–20 x 7/16" x 3/32 Hex. Nut	.07
54-189	No. 8–32 Wing Nut	.02
93-161	¼" External Shakeproof Lockwasher	.01
112-360	Set Installation Screw	.03
114-175	¼–20 x ½" Hex. Hd. M.S.	.02
118-30	Set Installation Link (or 118-36)	.19

Prices Subject to Change Without Notice.

DIAL AND TUNING MECHANISM ASSEMBLY

Diagram No.	Part No.	Description	Price
	26-330	Dial Scale	$.25
	34-132	Indexing Disc	.02
	34-138	Tuning Gear	.20
	34-140	Indicator Drive Gear	.07
	34-141	Idler Gear	.20
	34-158	Ratchet Gear	.34
	46-524	Tone Control Knob	.25
	46-527	Volume Control Knob	.37
	46-528	Selector Knob—L.H.	.37
	46-583	Selector Knob—R.H.	.37
	57-1029	Escutcheon	4.50
	59-151	Dial Pointer	.25
	59-169	Tone Control Pointer	.28
	73-2	No. 6-32 x 3/16" Hdless. Set Screw	.03
	80-232	Knob Retaining Spring (46-527)	.02
	80-331	Cross Arm Return Spring	.04
	80-332	Cam Lever Spring	.03
	80-336	Ratchet Gear Return Spring	.01
	80-341	Kick-Off Spring	.01
	80-342	Tuning Shaft Spring	.01
	80-343	Switch Spring	.01
	80-344	Switch Spring	.03
	80-379	Pointer Retaining Spring	.03
	80-426	Pointer Drive Tension Spring	.01
S3	80-476	Selector Knob Spring—L.H.	.04
	80-477	Selector Knob Spring—R.H.	.04
	100-31	Dial Light Bulb	.08
	126-481	Dial Glass Shield (2 used)	$.02
	149-44	Adjusting Spring & Core (3 used)	.40
	192-82	Dial Glass (2 used)	.38
L7	S-10826	Solenoid End Plug & Bracket Assembly	.30
	S-10829	Solenoid & Terminal Assembly	.79
	S-10831	Ratchet & Bracket Assembly	.63
	S-10834	Mounting Plate & Lever Assembly	.59
	S-11029	Drive Arm Bracket & Stud Assembly	.19
	S-11030	Pointer Bracket Assembly	.15
	S-11031	Dial Drum & Bracket Assembly (35-8)	.80
	S-11051	Tuning Shaft & Gear Assembly	.89
	S-11082	Turret Assembly	3.34
S5	S-11237	Escutcheon, Dial Glass & Selector Knob Assembly	9.47
	S-11270	Mute Switch Assembly	.67
	S-11971	Dial Light Socket & Wire Assembly	.24
	S-11972	Selector Knobs, Housing & Clamp Assembly	2.06
	S-12050	Tone Control Dial & Pulley Assembly (26-351)	.76
	S-12120	Dial Cord & Eyelet Assembly	.06
	S-13649	Cross Arm Assembly	1.10
	S-13711	Tuning & Trim Knob Assembly (46-525 & 682)	1.00

PARTS LIST MODEL 6MF780E (CHASSIS 6D80E)

The parts list for Model 6MF780E is the same as for Model 6MF780 with the following parts omitted and added.

ADD

Diagram No.	Part No.	Description	Price
T3	95-1027	Output Transformer	$2.70
SK2	78-219	Short Wave Converter Socket	.12
	S-13744	Motor Noise Suppression Kit	3.25
	202-526	Instruction Book	.05

OMIT

Part No.	Description	Price
95-1026	Output Transformer	$2.50
S-13742	Motor Noise Suppression Kit	2.50
202-523	Instruction Book	.05

PARTS LIST MODEL 6MM790 (CHASSIS 6D90)

The parts list for Model 6MM790 is the same as for Model 6MF780 with the following parts omitted and added.

ADD

Part No.	Description	Price
202-539	Instruction Book	$ .05

OMIT

Part No.	Description	Price
202-523	Instruction Book	$ .05

PARTS LIST MODEL 6MM790E (CHASSIS 6D90E)

The parts list for Model 6MM790E is the same as for Model 6MF780 with the following parts omitted and added.

ADD

Diagram No.	Part No.	Description	Price
	202-543	Instruction Book	$ .05
T3	95-1027	Output Transformer	2.70
SK2	78-219	Shortwave Converter Socket	.12
	S-13744	Motor Noise Suppression Kit	3.25

OMIT

Diagram No.	Part No.	Description	Price
	202-523	Instruction Book	$ .05
T3	95-1026	Output Transformer	2.50
	S-13742	Motor Noise Suppression Kit	2.50

Prices Subject to Change Without Notice.

SERVICE MANUAL

FOR

1946 HUDSON AUTOMOBILE RECEIVER

SPECIFICATIONS AND CIRCUIT FEATURES

MODEL DB46—PART No. 208815

WITH

FOOT SWITCH AND VOLUME CONTROL

TUBE COMPLEMENT: 7A7 R.F., 7B8 Converter, 7A7 I.F., 7B6 Detector, A.V.C., 1st Audio, 7C5 Beam Power Output, 7Y4 Rectifier.

TUNING RANGE: 540 to 1600 Kilocycles.

AUTOMATIC POSITIONS: 5 Plus "M" (manual).

SPEAKER: 6″ Dynamic externally mounted behind instrument panel. Voice coil impedance 3.2 ohms at 400 cycles. Field resistance 4 ohms cold.

TONE CONTROL: Continuously variable.

POWER OUTPUT: Maximum 5.5 watts. Measured at voice coil.

VIBRATOR: Non-synchronous.

POWER RATING: Current drain 7.5 amperes. Fuse—20 amperes.

SENSITIVITY: 4 Microvolts at one watt output.

I.F. FREQUENCY: 265 Kilocycles.

WARRANTY AND SERVICE

The 1946 Hudson Receiver is covered by warranty against defect in material and workmanship for a period of 90 days after retail delivery.

This warranty covers a receiver installed at the factory or a receiver installed in the field as an accessory.

All warranty claims must be made to the Hudson Dealer. Do NOT send claims to the radio manufacturer.

OPERATING INSTRUCTIONS

This radio incorporates the new Hudson Automatic Touch Tuning with Foot Volume and Selector Control. The purpose and position of each control is shown in figure 1.

TO TURN RADIO ON

Press the push button on right side below ON-OFF indicator window and allow receiver to reach operating temperature. (Approximately 20 seconds.)

MANUAL TUNING

1. Press the automatic tuning push button on the left side beneath automatic indicator window several times or until the letter "M" appears on the automatic indicutor.
2. Pull manual tuning (right hand) control knob outward and turn to tune in desired stations. Tune to exact frequency for the best tone quality.

VOLUME

Adjust left hand control knob for desired volume.

TONE CONTROL

The tone control is located directly behind the volume control knob (Fig. 1). Rotating this control to the right or left will change the tone of the receiver. Turning to the right will emphasize the high notes, while turning to the left will emphasize the bass notes.

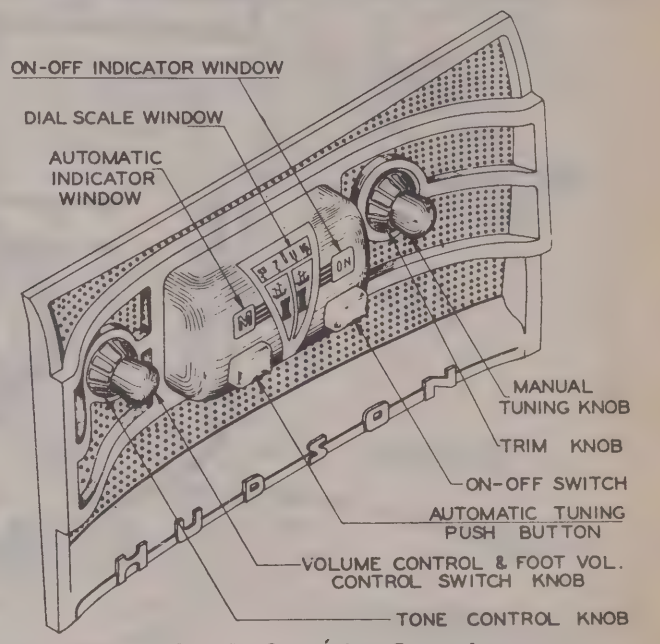


Fig. 1. Operating Controls.

AUTOMATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted, proceed as follows:

1. Press the automatic tuning push button (on the left side) until Number 1 appears in the automatic indicator window.
2. Pull the manual tuning knob OUTWARD to engage the automatic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception. CAUTION: DO NOT ATTEMPT TO FORCE TUNING KNOB IN. Knob will return to the "IN" position when the automatic tuning push-button is pressed.
4. Press the automatic station selector push button, pull manual tuning knob outward, and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the AUTOMATIC button to return to MANUAL tuning, or to any one of the stations selected on the automatic.

FOOT CONTROL

The Foot Control provides a convenient means of selecting stations, controlling the volume, and muting the set without taking the hands off the steering wheel or the eyes from the road. Its function is identical to that of the station selector push button and the volume control knob combined. The foot control requires no set up or other adjustment. Press the foot control button all the way down to change stations. Press lightly to silence radio during conversation. Turn the knob with the shoe tip to adjust the volume to any desired point. When using the foot volume control feature turn the panel volume control fully to the left, or until it clicks.

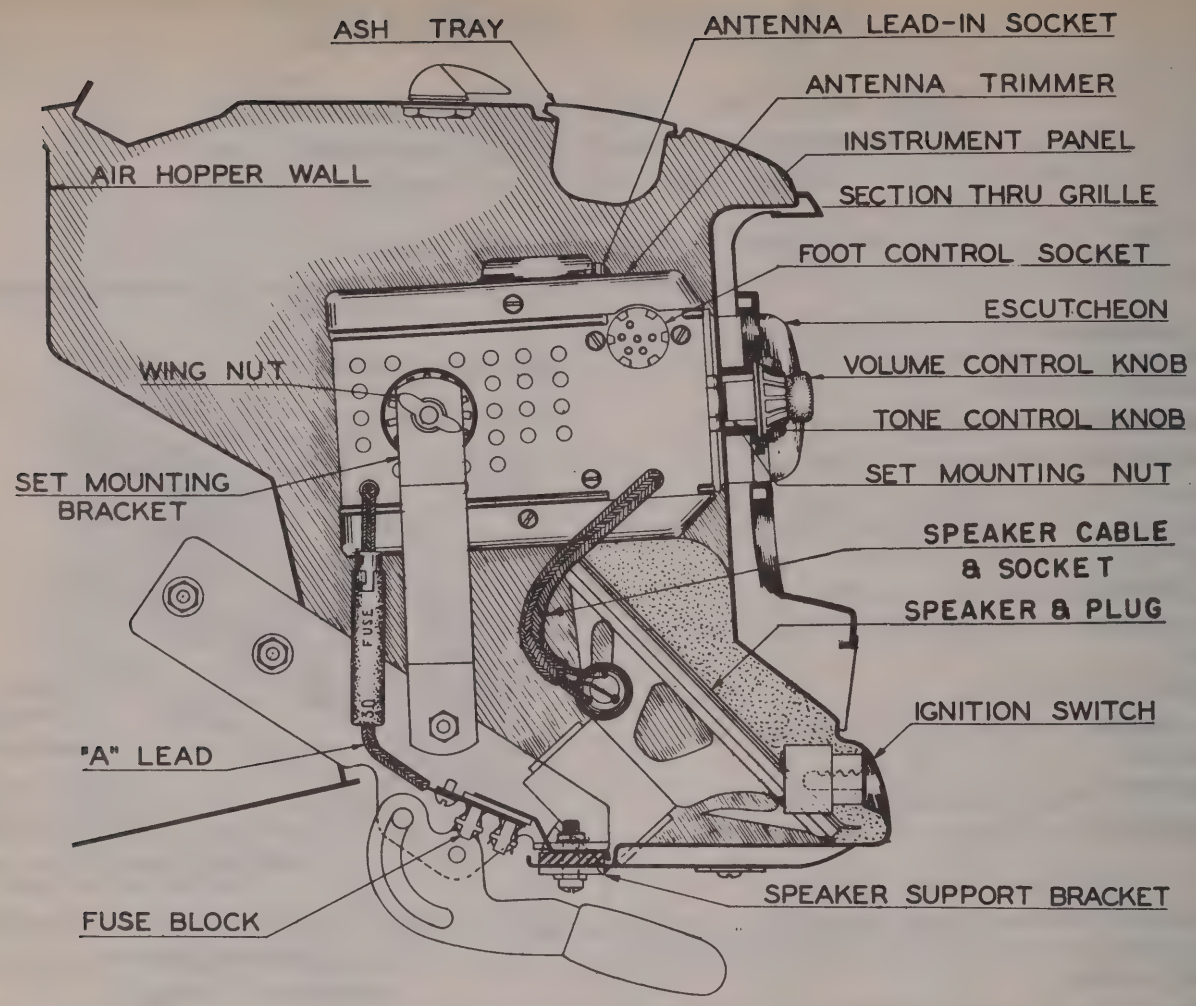


Fig. 2. Mounting Details and Connections

RADIO INSTALLATION INSTRUCTIONS

1. Install the antenna. Complete instructions are packed with each antenna kit.
2. Remove the decorative plate, in the center of the grille, covering the radio opening.
3. Remove the floor mat around the clutch and brake pedals. Place the foot control over the holes provided in the floor board. Fasten it with the three No. 8 R.H. self-tapping screws furnished in the installation kit (Fig. 3).
4. Dress the foot control lead to the left of the clutch pedal and up behind the fire wall pad.
5. Lift the cap from the foot control. Replace the floor mat and cut a hole for the foot control button. To replace the foot control cap, press it firmly and turn until the notches in the cap slip into the flanges on the foot control button.
6. Remove accessory switch bracket.
7. Plug the foot control cable into the socket provided on the left end of the receiver. With this end of the receiver down and the control shafts to the right, push the receiver up between the instrument panel and the air hopper as far as it will go. Turn the radio clockwise until the knob shafts point downward. Lift the front of the receiver up until the shafts slide through the slots provided below the shaft openings in the instrument panel. Bring the receiver forward so that the knob shafts protrude through the shaft openings.
8. Fit the knob shaft bushing nuts on the shafts and tighten as much as possible with the fingers. Place the tips of long nose pliers in the holes in the nuts and tighten securely.
9. Attach set mounting bracket by fastening one end to the side of the receiver case with the wing nut. Fasten the other end of the radio mounting bracket to the cowl ventilator handle bracket with ¼" x ¾" M.S., flat washer, and nut. (Fig. 2.)
10. Remove cardboard protector from speaker unit and fasten speaker and bracket assembly in place with two ¼" x ¾" M.S. flat washers, two lock washers, and two nuts provided. (Fig. 2.) Plug the speaker cable into the socket provided on the speaker frame.
11. Fasten the controls in place as shown in figure 1. NOTE: Tuning knob must be placed 3/16" away from the instrument panel in order to rotate freely in the automatic position.
12. Fasten the accessory switch bracket back in place.
13. Remove the ash tray assembly and plug the antenna lead into the socket provided on the top of the receiver.
14. Fasten the "A" lead to the fuse block as indicated in figure 2.
15. Turn the receiver on and allow it to operate for approximately fifteen minutes in order for it to reach normal operating temperature. Tune in a weak station near 1200 Kc. Reach through the ash tray opening with a small screw driver and adjust the antenna trimmer, located on the top of the receiver, for maximum volume. (Fig. 2.) Replace ash tray.

INTERFERENCE ELIMINATION

IMPORTANT: Use the utmost care in the following operations to insure freedom from motor noise. Be sure that good ground contacts are made between the interference condensers and the car body. If necessary, clean away paint or dirt with emery paper. Tighten all nuts and bolts securely.

1. Remove the top mounting screw of the horn relay near the voltage regulator and under this screw mount the condenser No. 22-1537. Connect the lead to the voltage regulator battery terminal. (Fig. 4.)

2. Install suppressor in center hole of distributor cap. Place high tension lead in the top of suppressor. Be sure the suppressor and the lead are fastened securely. (Fig. 5.)

3. On the six cylinder car, remove the bolt, above the ignition coil, from the firewall. Mount the condenser No. 22-1537 under this bolt. Connect the lead to the coil terminal as shown in figure 6A.

   On the eight cylinder car, remove the bottom screw from the ignition coil mounting bracket. Install the condenser No. 22-1537 under the screw. Connect the lead to the coil terminal as shown in figure 6B.

4. Loosen the upper rear cap screw of the engine water jacket plate. **CAUTION: Do not REMOVE cap screw.** Slide the slotted bracket of the condenser No. 22-1260 under the head of this screw. Tighten the screw.

   Attach the condenser lead to the water temperature element in the head. (Fig. 7A.)

5. Remove the tape from the hole (located near the left rear cylinder head nut) in the dash. Fasten the flat ground strip to this hole with a sheet metal screw and lock washer. On the six cylinder car, place the other end of the strip on top of the regular stud nut, and fasten it in place with the special nut furnished in the installation kit. (Fig. 7A.) On the eight cylinder cars, bolt the other end of the strap under the regular stud nut. (Fig. 7B.)

6. Install the motor hood bond spring No. 80-145 as shown in Figure 8. Fasten with No. 8 sheet metal screw. Part No. 112-365.

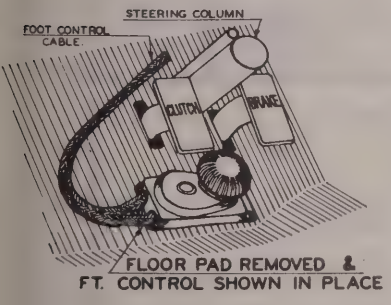


Fig. 3.

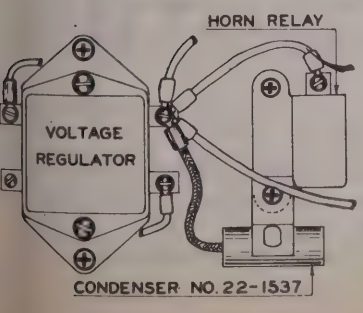


Fig. 4.

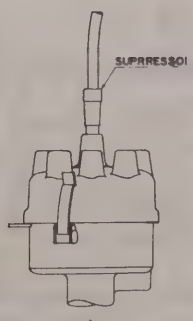


Fig. 5.

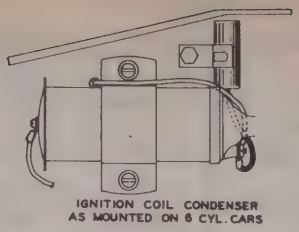


Fig. 6A.

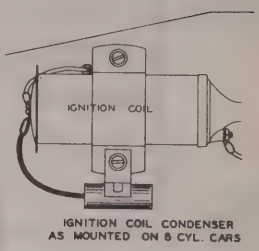


Fig. 6B.

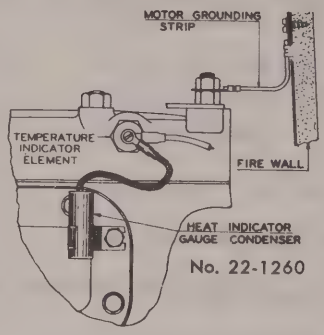


Fig. 7A.

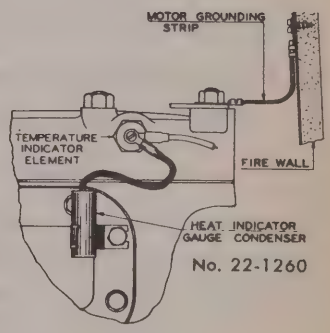


Fig. 7B.

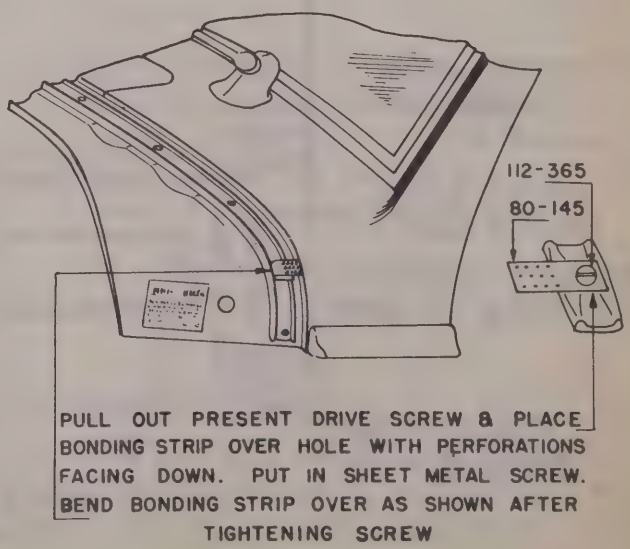

112-365
80-145
PULL OUT PRESENT DRIVE SCREW & PLACE BONDING STRIP OVER HOLE WITH PERFORATIONS FACING DOWN. PUT IN SHEET METAL SCREW. BEND BONDING STRIP OVER AS SHOWN AFTER TIGHTENING SCREW

Fig. 8.

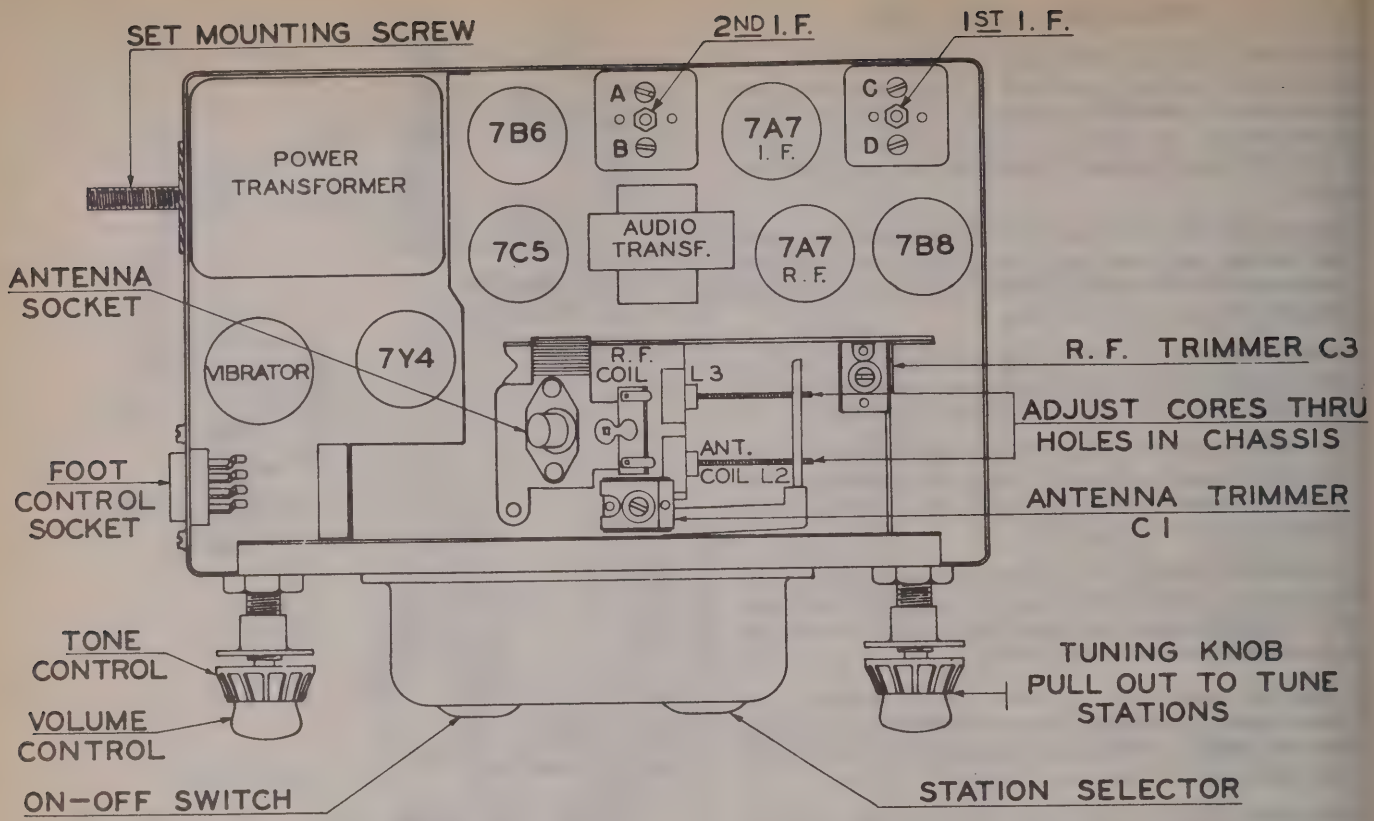


Fig. 10. Top View of Chassis

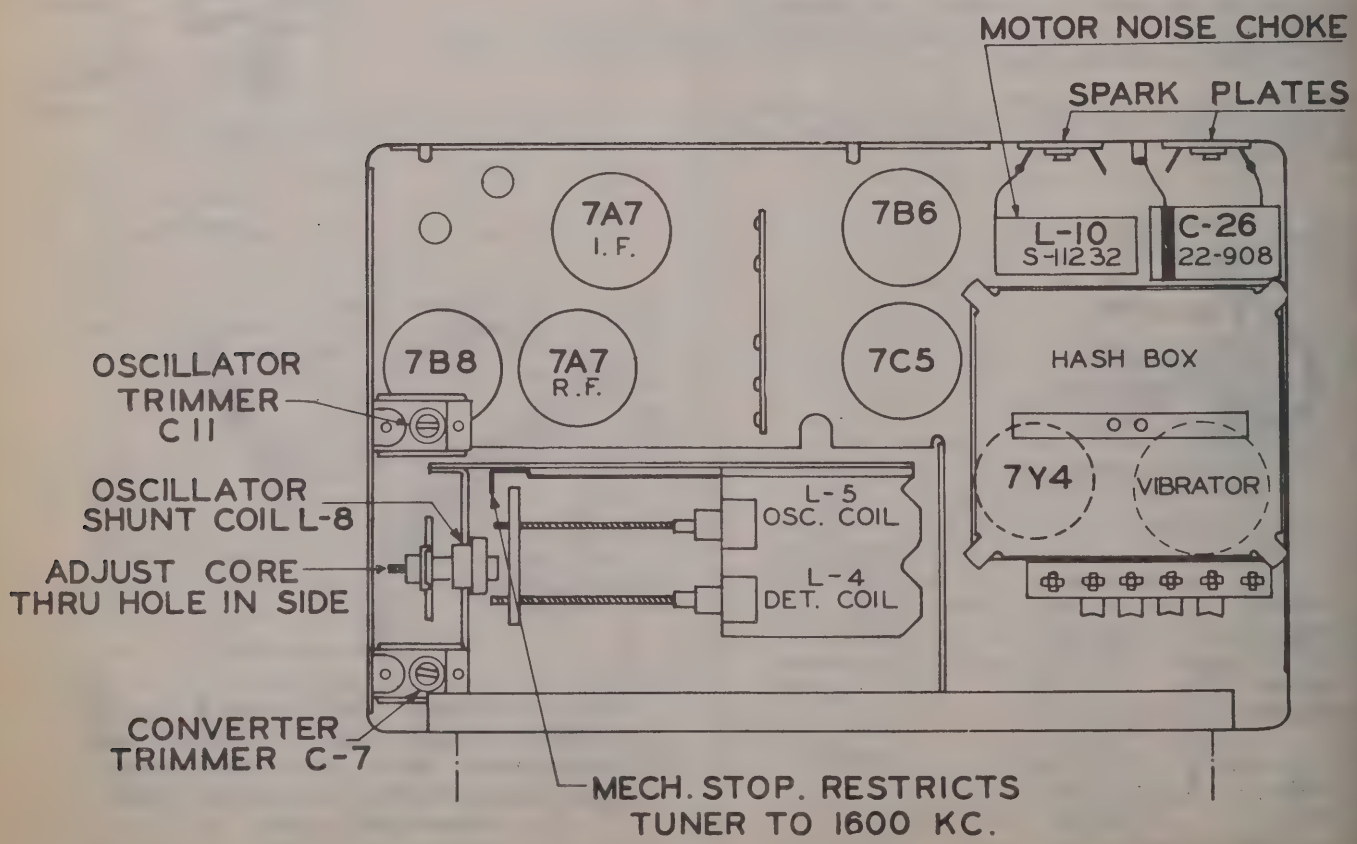


Fig. 11. Bottom View of Chassis

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; so follow these instructions carefully.

CAUTION: Make all adjustments on the receiver with volume control turned full on and foot volume control cable plugged into its socket. Reduce signal intensity as much as possible at signal generator. Connect output meter across voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C and D (Fig. 10), in the order named for maximum output. Repeat the operation to assure accurate alignment.

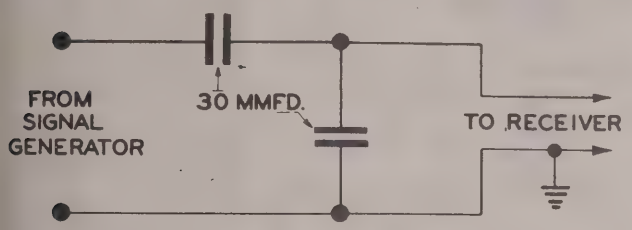


Figure 12. Dummy Antenna

Figure 12 shows the schematic of a recommended dummy antenna closely resembling actual antenna capacity to be used when aligning the R.F. section of the receiver.

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy illustrated in figure 12 to antenna lead in socket on receiver.
2. Set signal generator to 535 Kc.
3. Place set in manual tuning position and set dial to 535 Kc.
4. Adjust oscillator trimmer C-11 (Fig. 11) for maximum response.
5. Set signal generator to 1200 Kc.
6. Tune set to 1200 Kc.
7. Adjust converter trimmer C-7 (Fig. 11) and R.F. trimmer C-3 (Fig. 10) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

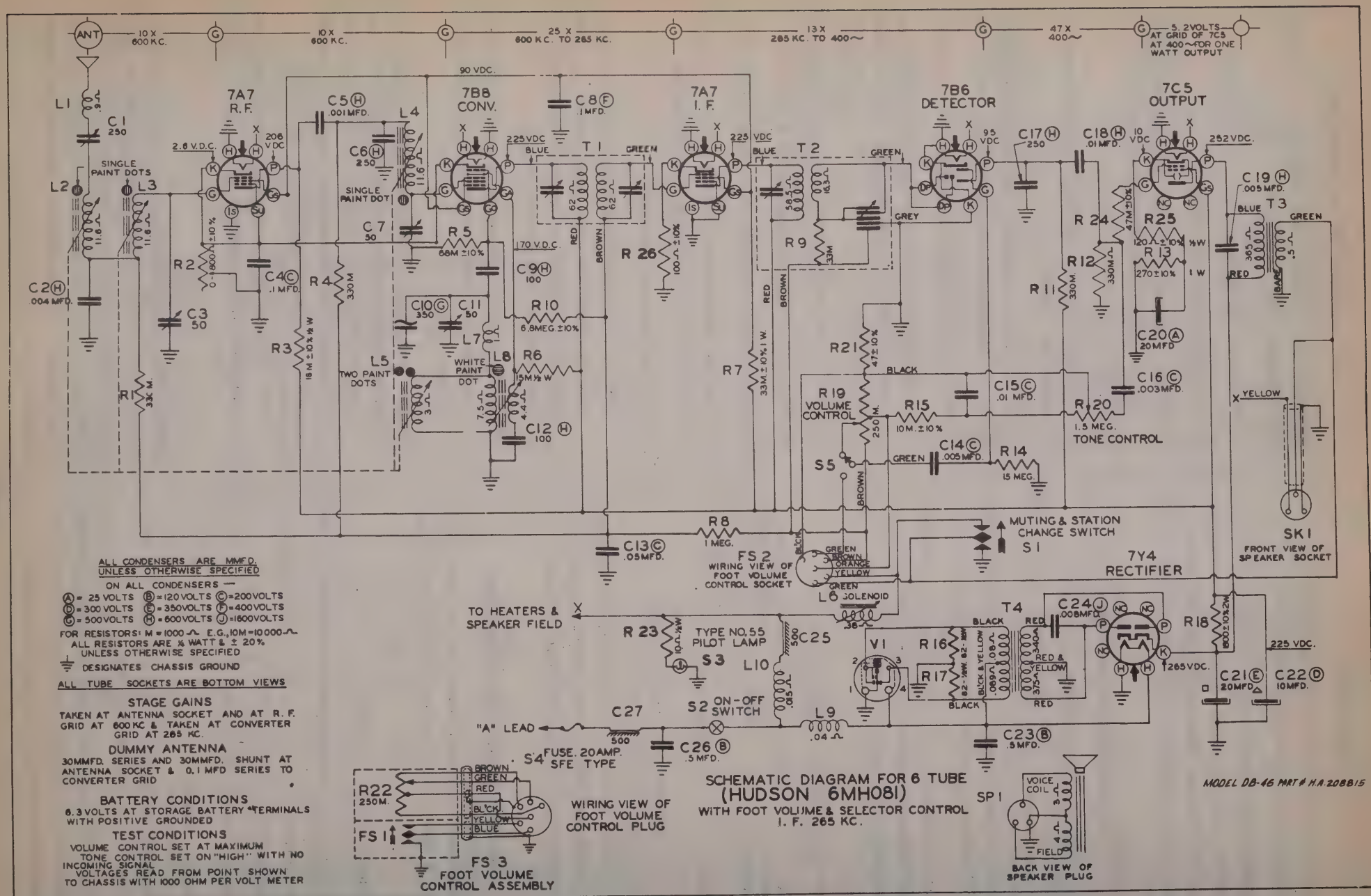
CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

1. Replace coil or core.
2. Set signal generator to 1700 Kc.
3. Connect signal generator leads through dummy illustrated in figure 12 to antenna receptacle on the receiver.
4. Set receiver dial to 1600 KC. (Maximum high frequency end of dial.)
5. Screw the core completely out of the antenna coil, the R.F. Coil, the converter coil, and the oscillator coil.
6. Adjust oscillator trimmer C-11 (Fig. 11) at 1700 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 10 and 11) for maximum output reading.
8. Replace cores to their approximate original positions.
9. Set generator dial and receiver dial to 1200 Kc.
10. Adjust oscillator core (Fig. 10) to scale at 1200 Kc.
11. Adjust the antenna core, R.F. core, and converter core (Fig. 10 and 11), for maximum output reading.
12. Set signal generator to 600 Kc.
13. "Rock in" Shunt oscillator coil (Fig. 10) for maximum output reading. (This should only be done as a last resort.) This is the same as rocking in the padder condenser on a ganged condenser receiver.
14. Check receiver at 1200 Kc. for calibration and gain. If receiver is off scale or weak, repeat operations 9, 10 and 11.
15. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc. the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

    After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc. Extend antenna to maximum before adjusting the antenna trimmer.


ANT
10 X 600 KC.
10 X 600 KC.
25 X 600 KC. TO 265 KC.
13 X 265 KC. TO 400~
47 X 400~
5.2 VOLTS AT GRID OF 7C5 AT 400~ FOR ONE WATT OUTPUT
90 VDC.
7A7 R.F.
7B8 CONV.
7A7 I.F.
7B6 DETECTOR
7C5 OUTPUT
SINGLE PAINT DOTS
SINGLE PAINT DOT
TWO PAINT DOTS
WHITE PAINT DOT
T1
T2
T3
T4
V1
L1
L2
L3
L4
L5
L6 SOLENOID
L7
L8
L9
L10
C1 250
C2 .004 MFD.
C3 50
C4 .1 MFD.
C5 .001 MFD.
C6 250
C7 50
C8 .1 MFD.
C9 100
C10 350
C11 50
C12 100
C13 .05 MFD.
C14 .005 MFD.
C15 .01 MFD.
C16 .003 MFD.
C17 250
C18 .01 MFD.
C19 .005 MFD.
C20 20 MFD
C21 20 MFD
C22 10 MFD.
C23 .5 MFD.
C24 .008 MFD.
C25 500
C26 .5 MFD.
C27 500
R1 33K M.
R2 800 ±10%
R3 18 M ±10% ½ W
R4 330 M.
R5 68M ±10%
R7 33M ±10% 1 W.
R8 1 MEG.
R9 33M
R10 6.8MEG. ±10%
R11 330 M.
R12 330M.
R13 270 ±10% 1 W
R14 15 MEG.
R15 10M. ±10%
R16 82-1W. 82-1W.
R17 82-1W.
R18 800 ±10% 2W
R19 VOLUME CONTROL 250 M.
R20 1.5 MEG. TONE CONTROL
R21 47 ±10%
R22 250M.
R23 10 ±1W
R24 47M ±10%
R25 120 ±10% ½W
R26 100 ±10%
S1 MUTING & STATION CHANGE SWITCH
S2 ON-OFF SWITCH
S3 TYPE NO. 55 PILOT LAMP
S4 FUSE. 20 AMP. SFE TYPE
S5
SP1
SK1 FRONT VIEW OF SPEAKER SOCKET
FS1
FS2 WIRING VIEW OF FOOT VOLUME CONTROL SOCKET
FS3 FOOT VOLUME CONTROL ASSEMBLY
WIRING VIEW OF FOOT VOLUME CONTROL PLUG
BACK VIEW OF SPEAKER PLUG
VOICE COIL
FIELD
TO HEATERS & SPEAKER FIELD
"A" LEAD
7Y4 RECTIFIER
225 VDC.
265 VDC.
252 VDC.
95 VDC
10 VDC
2.6 V.D.C.
206 VDC
170 V.D.C
ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED
ON ALL CONDENSERS —
(A) = 25 VOLTS (B) = 120 VOLTS (C) = 200 VOLTS
(D) = 300 VOLTS (E) = 350 VOLTS (F) = 400 VOLTS
(G) = 500 VOLTS (H) = 600 VOLTS (J) = 1600 VOLTS
FOR RESISTORS: M = 1000 Ω E.G., 10M = 10 000 Ω
ALL RESISTORS ARE ½ WATT & ± 20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT R. F. GRID AT 600 KC & TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
30MMFD. SERIES AND 30MMFD. SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM
TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL
VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
SCHEMATIC DIAGRAM FOR 6 TUBE (HUDSON 6MH081)
WITH FOOT VOLUME & SELECTOR CONTROL
I. F. 265 KC.
MODEL DB-46 PART # H.A. 208815

1946 RADIO RECEIVER KIT *
Model DB 46 (Part Number 208815)

Items included in kit are:

- Radio receiver
- Mounting bracket, screws, lockwashers, knobs
- Speaker and bracket assembly
- Foot volume control and switch assembly
- Distributor suppressor
- Temperature gauge condenser
- Ignition coil and generator condenser
- Motor hood bonding spring
- Motor bond strap
- Sheet metal screw
- Nut for 6 cyl. cars
- Lockwasher

RADIO ANTENNA KITS *

Part No. 209558—66″ Telescopic Antenna including all installation parts.

Part No. 209762—92″ Telescopic Antenna including all installation parts.

Part No. 205451—Vacuum Operated Antenna including all installation parts.

(See antenna kits for full installation instructions.)

NOTE: Kits marked * are not available from the radio manufacturer. See your Hudson dealer.

COILS AND CHOKES

Diag. No.	Zenith Part No.	Hudson Part No.	Description
L9	20-213	204890	Main hash choke
T1	95-916	209569	1st I.F. transformer
T2	95-917	209570	2nd I.F. transformer
L1	S8819	209741	Antenna motor noise choke assembly
L7	S11229	209568	Oscillator series coil assembly
L8	S11231	209576	Oscillator shunt coil assembly
L10	S11232	209571	Motor noise choke coil assembly
L5	S12053*	209574	Oscillator tuning coil assembly
L2	S12060*	209572	Antenna tuning coil assem.
L3	S12060*	209572	R.F. tuning coil assembly
L4	S12060*	209572	Detector tuning coil assem.

Note: In ordering coils marked (*), be sure to give color code information.

CONDENSERS

Diag. No.	Zenith Part No.	Hudson Part No.	Description	
C 9, C12	22-162	204900	100 mmfd.	600 V.
C 8	22-170	204901	.1 mfd.	400 V.
C17	22-182	204902	250 mmfd.	600 V.
C 4	22-190	209577	.1 mfd.	200 V.
C13	22-250	204904	.05 mfd.	200 V.
C19	22-838	204905	.005 mfd.	600 V.
C14	22-906	204906	.005 mfd.	200 V.
C23, C26	22-908	204907	.5 mfd.	120 V.
C25, C27	22-1076	204909	Dual spark plate	
C 6	22-1136	209585	250 mmfd.	600 V.
C 5	22-1169	209584	.001 mfd.	600 V.
C18	22-1170	204910	.01 mfd.	600 V.
C16	22-1180	209587	.003 mfd.	200 V.
C 2	22-1244	204915	.004 mfd.	600 V.
C 3	22-1376	209583	R.F. trimmer	
C 7	22-1377	209582	Detector trimmer	
C11	22-1378	209581	Oscillator trimmer	
C20, C21, C22	22-1387	209578	Dry electrolytic - 20 mfd. - 25 V. x 10 mfd. - 300 V. x 20 mfd. - 350 V.	
C24	22-1448	209579	.008 mfd.	1600 V.
C 1	22-1462	209580	Antenna trimmer	
C15	22-1466	209754	.01 mfd.	200 V.
C10	22-1478	209919	350 mmfd. compensator	

RESISTORS

R19, R20, S 5	63-1334	209672	Vol. control, and SW. tone control	
R18	63-1368	209920	1800 ohm 2 watt W.W.	
R2	63-1379	207877	Sensitivity control. 0-800 ohm	
R 8	63-1390	209922	1 megohm	¼ watt
R 1, R 4, R11, R12	63-1392	209923	330M ohm	¼ watt
R21	63-1393	209924	47 ohm	¼ watt
R15	63-1394	209925	10M ohm	¼ watt
R 5	63-1396	209926	68M ohm	¼ watt
R 7	63-1398	209928	33M ohm	¼ watt
R16, R17	63-1399	209929	82 ohm	½ watt
R14	63-1400	209930	15 megohm	¼ watt
R 6	63-1401	209931	15M ohm	½ watt
R13	63-1369	209921	270 ohm 1 watt W.W.	
R25	63-1410	208649	120 ohm ½ watt W.W.	
R26	63-1414	208709	100 ohm	¼ watt
R10	63-1416	207939	6.8 megohm	¼ watt
R24	63-1417	207940	47000 ohms	¼ watt
R23	63-1419	208591	10 ohm ½ watt W.W.	
R3	63-1411	208000	18000 ohm	¼ watt

MISCELLANEOUS

	52-202	204935	Battery cable (set to fuse)
	52-254	209551	Battery cable (fuse to fuse block)
SK1	52-279	209968	Speaker cable and plug
	78-281	209745	Vibrator socket
FS2	78-551	209683	Foot switch cable plug socket
	78-596	209746	Tube socket - loktal base (8 contact)
S2	85-339	209747	On-Off switch
	93-456	209748	Vibrator cushion washer
T4	95-914	209684	Power transformer
T3	95-915	209685	Output transformer
S4	136-12	18269	Fuse - 20 amp.
V1	190-20	209686	Vibrator

Diag. No.	Zenith Part No.	Hudson Part No.	Description
	202-420	209749	Installation instruction book
S1	S11269	209566	Hand selector and muting switch assembly
	S11310	209934	Antenna socket, bracket & terminal assembly
FS3	S11758	208812	Foot switch, vol. control & cable assembly

SPEAKER AND MOUNTING COMPONENTS

	12-937	204020	Speaker support bracket
SP1	49-538	208826	6″ dynamic speaker
	54-30	170567	No. 8/32 x 5/16 x 7/64 hex nut
	57-945	204022	Speaker cover plate
	114-88	205287	No. 8/32 x 1/2 hex hd. M.S.
	114-167	205288	No. 10/32 x 5/16 hex acorn hd. M.S.
	196-53	204024	Rubber speaker gasket
	208-538*	209751	Cone & voice coil assem.

Note: When ordering cone and voice coil assembly marked *, be sure to give manufacturer's code letter.

INSTALLATION PARTS AND KNOBS

	S11321	209753	Installation kit complete
	12-938	204021	Set mounting bracket
	22-1260	152021	Temperature gauge cond.
	22-1537	208592	Generator and ignition coil condenser
	46-459	205293	Tone control knob
	54-157	70874	1/4-20 x 7/16 x 3/16 hex nut
	54-173	205283	Set mounting nut
	54-174	205289	1/4-20 wing nut
	63-1252	205281	Distributor suppressor
	80-145	205282	Motor hood bond spring
	80-232	209752	Knob retaining spring
	112-310	170687	Foot Sw. mtg. screw
	112-365	170304	No. 8 x 1/2″ B.H.S.M. screw
	114-168	70872	1/4-20 x 3/4 hex hd. M.S.
	S12271	209936	Tuning control & trim. knob assem. (46-550 & 584)
	S12272	209937	Volume control knob and spring assem. (46-549)
	93-577	12857	.062 x 17/64 x 3/4 steel washer
	83-986	204481	Motor bond strap
	112-361	71707	No. 8 self tapping screw
	93-575	170395	Lock washer
	54-188	170859	Hex nut (for 6 cyl. cars only)

DIAL AND TUNING MECHANISM ASSEMBLY

	26-337	209682	Dial scale (manual tuning)
	34-132	209691	Indexing disc
	34-133	209692	Ratchet gear
	34-135	209789	Volume control gear
	46-581	209553	Selector knob (2 used)
	57-1061	209560	Escutcheon
	57-1151	209694	Name plate
	59-158	204040	Dial pointer
	80-329	209695	Gear indexing spring
	80-331	209681	Cross arm return spring
	80-332	209696	Cam lever spring
	80-336	209697	Ratcher gear return spring
	80-340	209698	Lever spring
	80-341	209699	Kick-off spring
	80-342	209700	Tuning shaft spring
	80-343	209701	Solenoid switch spring
	80-344	209702	Solenoid switch contact spring
	80-425	209703	Knob return spring
S3	100-31	71550	Dial light bulb
	149-44*	209799	Adjusting spring & core
	188-45	209705	Turret screw lock ring
	S10826	209706	Solenoid end plug and bracket assembly
L6	S10829	209567	Solenoid and terminal assembly
	S10831	209707	Ratchet and bracket
	S10836	209708	Cross arm assembly
	S11052	204025	Tuning shaft and gear assembly
	S11082	209709	Turret assembly
	S11313	209738	Dial drum and bracket assembly
	S11494	209739	Mounting plate and lever assembly
	S11976	209740	Dial light socket and wire assembly

Note: In ordering Adjusting Spring and Core marked (*), be sure to give color code information.

Printed in U.S.A.

SERVICE MANUAL

FOR

HUDSON AUTOMOBILE RECEIVER

SPECIFICATIONS AND CIRCUIT FEATURES

MODEL DB47—PART No. 206990 and 206991

WITH

FOOT SELECTOR CONTROL

TUBE COMPLEMENT: 7A7 R.F., 7B8 Converter, 7A7 I.F., 7B6 Detector, A.V.C., 1st Audio, 7C5 Beam Power Output, 7Y4 Rectifier.

TUNING RANGE: 540 to 1600 Kilocycles.

AUTOMATIC POSITIONS: 5 Plus "M" (manual).

SPEAKER: 6" Permanent magnet externally mounted behind instrument panel. Voice coil impedance 3.2 ohms at 400 cycles.

TONE CONTROL: Continuously variable.

POWER OUTPUT: Maximum 4.5 watts. Measured at voice coil.

VIBRATOR: Non-synchronous.

POWER RATING: Current drain 6 amperes.

FUSE: 10 amperes. Type MDL-10 fusetron.

SENSITIVITY: 4 Microvolts at one watt output.

I.F. FREQUENCY: 265 Kilocycles.

WARRANTY AND SERVICE

The DB47 Hudson Receiver is covered by warranty against defect in material and workmanship for a period of 90 days after retail delivery.

This warranty covers a receiver installed at the factory or a receiver installed in the field as an accessory.

IMPORTANT

A warranty registration tag is furnished with each receiver. This tag must be filled in and attached to the unit at the time of retail delivery and must accompany the receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail. All warranty labor claims must be made to the Hudson Dealer. Do NOT send claims to the radio manufacturer. Defective parts in warranty will be replaced, no charge to you, by the nearest Zenith Distributor.

OPERATING INSTRUCTIONS

This radio incorporates the new Hudson automatic touch tuning with foot selector control. The purpose and position of each control is shown in figure 1.

TO TURN RADIO ON

Press the on-off switch button, on right side below on-off indicator window, and allow receiver to reach operating temperature. (Approximately 20 seconds.)

MANUAL TUNING

1. Press the automatic tuning push button, on the left side beneath the automatic indicator window, several times or until the letter "M" appears in the automatic indicator window.
2. Pull manual tuning (right hand) control knob outward and turn to tune in desired stations. Tune to exact frequency for the best tone quality.

VOLUME

Adjust left hand control knob for desired volume.

TONE CONTROL

The tone control is located directly behind the volume control knob (Fig. 1). Rotating this control to the right or left will change the tone of the receiver. Tuning to the right will emphasize the high notes, while tuning to the left will emphasize the bass notes.

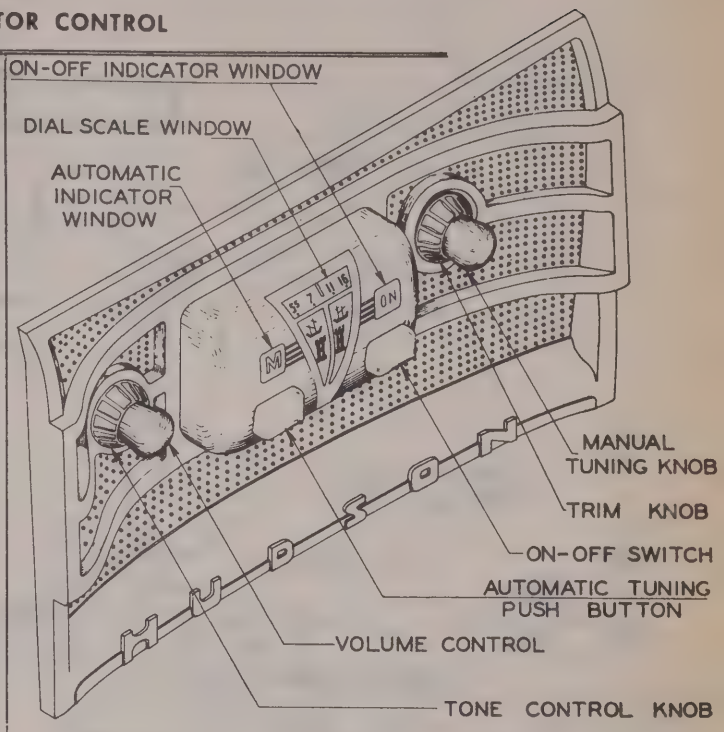


Fig. 1. Operating Controls.

AUTOMATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted, proceed as follows:

1. Press the automatic tuning push button (on the left side) until Number 1 appears in the automatic indicator window.
2. Pull the manual tuning knob OUTWARD to engage the automatic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception. CAUTION: DO NOT ATTEMPT TO FORCE TUNING KNOB IN. Knob will return to the "IN" position when the automatic tuning push-button is pressed.
4. Press the automatic station selector push button, pull manual tuning knob outward, and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the AUTOMATIC button to return to MANUAL tuning, or to any one of the stations selected on the automatic.

FOOT CONTROL

The foot control provides a convenient means of selecting stations, and muting the set without taking the hands off the steering wheel or the eyes from the road. Its function is identical to that of the station selector push button. The foot control requires no set up or other adjustment. Press the foot control button all the way down to change stations. Press lightly to silence radio during conversation.

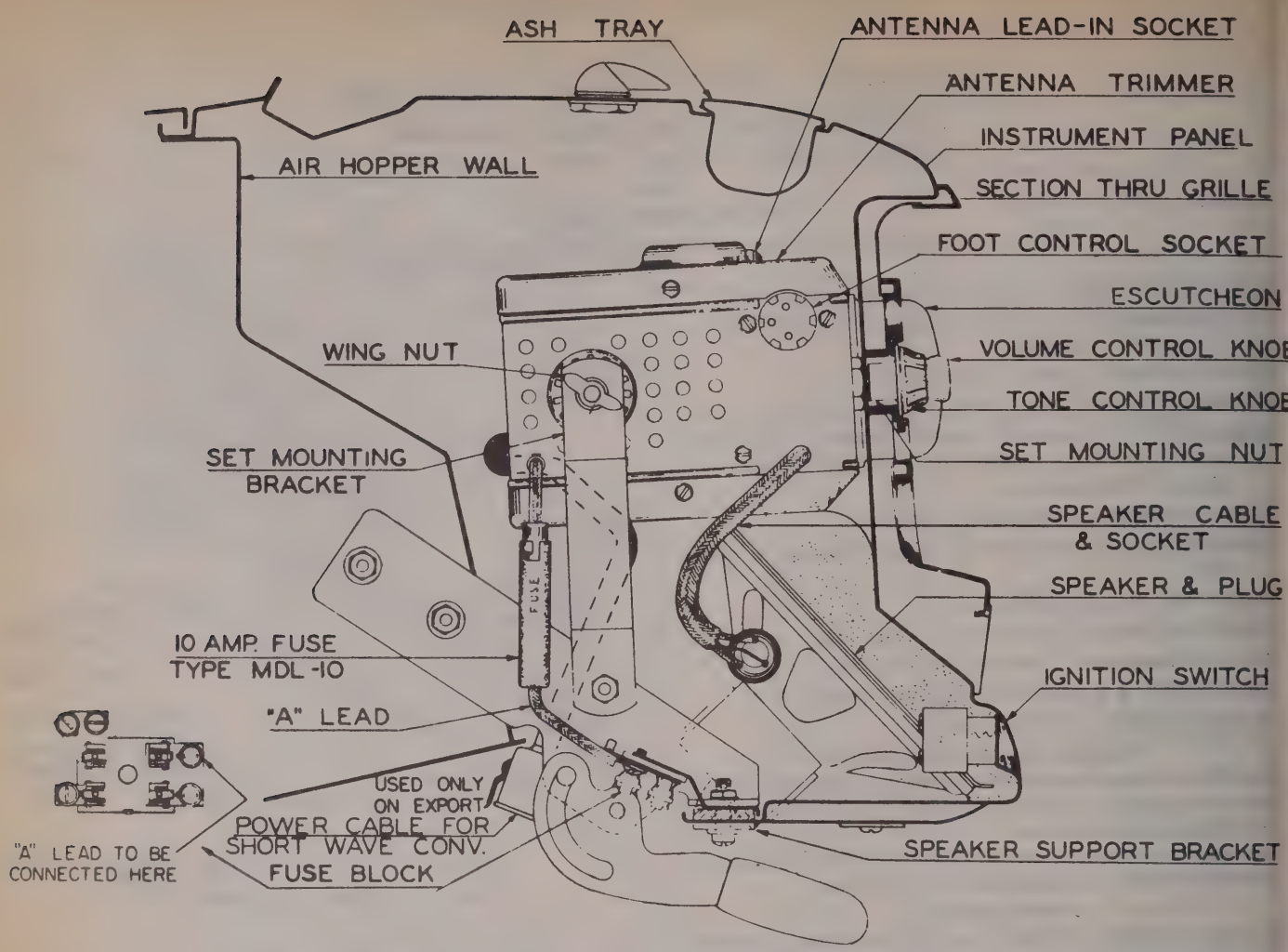


Fig. 2. Mounting Details and Connections

RADIO INSTALLATION INSTRUCTIONS

1. Install the antenna. Complete instructions are packed with each antenna kit.
2. Remove the decorative plate, in the center of the grille, covering the radio opening.
3. Remove the floor mat around the clutch and brake pedals. Place the foot control over the holes provided in the floor board. Fasten it with the three No. 8 R.H. self-tapping screws furnished in the installation kit (Fig. 3).

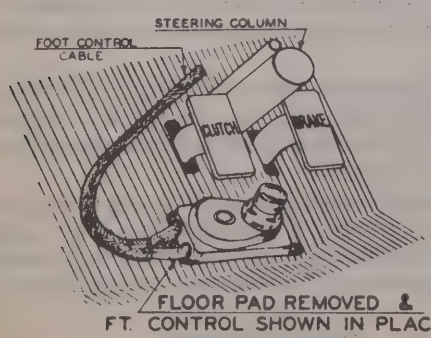


Fig. 3.

4. Dress the foot control lead to the left of the clutch pedal and up behind the fire wall pad.
5. Replace the floor mat and cut a hole for the foot control button.
6. Remove accessory switch bracket.
7. Plug the foot control cable into the socket provided on the left end of the receiver With this end of the receiver down and the control shafts to the right, push the receiver up between the instrument panel and the air hopper as far as it will go. Turn the radio clockwise until the knob shafts point downward. Lift the front of the receiver up until the shafts slide through the slots provided below the shaft openings in the instrument panel. Bring the receiver forward so that the knob shafts protrude through the shaft openings.
8. Fit the knob shaft bushing nuts on the shafts and tighten as much as possible with the fingers. Place the tips of long nose pliers in the holes in the nuts and tighten securely.
9. Attach set mounting bracket by fastening one end to the side of the receiver case with the wing nut. Fasten the other end of the radio mounting bracket to the cowl ventilator handle bracket with 1/4" x 3/4" M.S., flat washer, and nut. (Fig. 2.)
10. Remove cardboard protector from speaker unit and fasten speaker and bracket assembly in place with two 1/4" x 3/4" M.S. flat washers, two lock washers, and two nuts provided. (Fig. 2.) Plug the speaker cable into the socket provided on the speaker frame.
11. Fasten the controls in place as shown in figure 1. NOTE: Tuning knob must be placed 3/16" away from the instrument panel in order to rotate freely in the automatic position.
12. Fasten the accessory switch bracket back in place.

13. Remove the ash tray assembly and plug the antenna lead into the socket provided on the top of the receiver.
14. Fasten the "A" lead to the unfused terminal of the fuse block as indicated in figure 2.

IMPORTANT: Turn the receiver on and allow it to operate for approximately fifteen minutes in order for it to reach normal operating temperature. Tune in a weak station near 1200 Kc. Remove the ash tray from the instrument panel of the car. Reach through the ash tray opening with a small screw driver and adjust the antenna trimmer, located on the top of the receiver, for maximum volume. (Fig. 2.) Replace the ash tray.

INTERFERENCE ELIMINATION

IMPORTANT: Use the utmost care in the following operations to insure freedom from motor noise. Be sure that good ground contacts are made between the interference condensers and the car body. If necessary, clean away paint or dirt with emery paper. Tighten all nuts and bolts securely.

1. Remove the top mounting screw of the horn relay, near the voltage regulator, and under this screw mount the condenser No. 22-1537. Connect the lead to the voltage regulator battery terminal. (Fig. 4.)
2. Install suppressor, No. 63-1252, in the center hole of the distributor cap. Place high tension lead in the top of suppressor. Be sure the suppressor and the lead are fastened securely. (Fig. 5.)
3. On the six cylinder car, remove the bolt, above the ignition coil, from the firewall. Mount the condenser No. 22-1537 under this bolt. Connect the lead to the coil terminal as shown in figure 6A.

   On the eight cylinder car, remove the bottom screw from the ignition coil mounting bracket. Install the condenser No. 22-1537 under the screw. Connect the lead to the coil terminal as shown in figure 6B.
4. Loosen the upper rear cap screw of the engine water jacket plate. **CAUTION: Do not REMOVE cap screw.** Slide the slotted bracket of the condenser No. 22-1260 under the head of this screw. Tighten the screw. Attach the condenser lead to the water temperature element in the head. (Fig. 7.)
5. Fasten the motor bond strap, No. 83-986, to the left rear cylinder head stud with the special nut furnished. Remove the tape from the hole in the dash, located near the left rear cylinder head nut, and fasten the loose end of the motor bond strap to the hole with washer, No. 93-575, and sheet metal screw # 112-361. (Fig. 7)
6. Install the motor hood bond spring No. 80-145 as shown in Figure 8. Fasten with No. 8 sheet metal screw. Part No. 112-365.

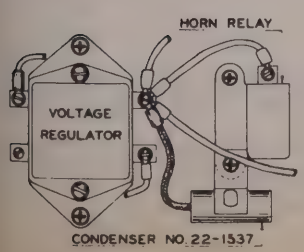


Fig. 4.

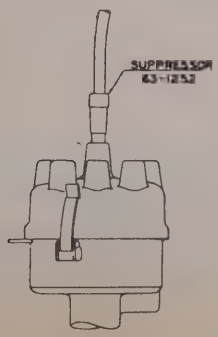


Fig. 5.

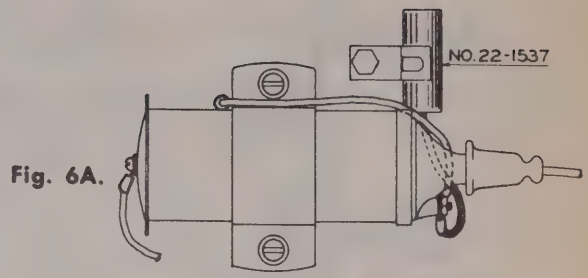


Fig. 6A.

IGNITION COIL CONDENSER AS MOUNTED ON 6 CYL. CARS

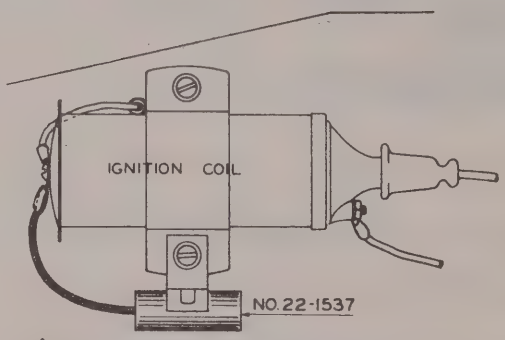


Fig. 6B.

IGNITION COIL CONDENSER AS MOUNTED ON 8 CYL. CARS

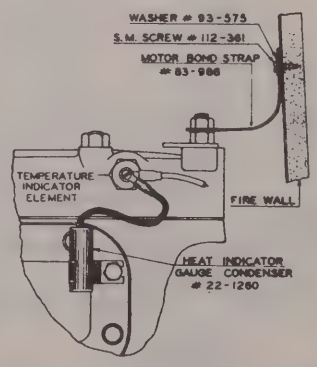


Fig. 7.

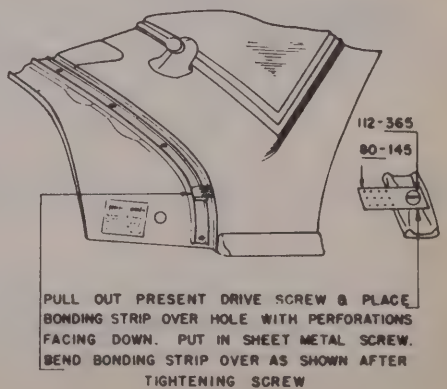

112-365
80-145
PULL OUT PRESENT DRIVE SCREW & PLACE BONDING STRIP OVER HOLE WITH PERFORATIONS FACING DOWN. PUT IN SHEET METAL SCREW. BEND BONDING STRIP OVER AS SHOWN AFTER TIGHTENING SCREW

Fig. 8.

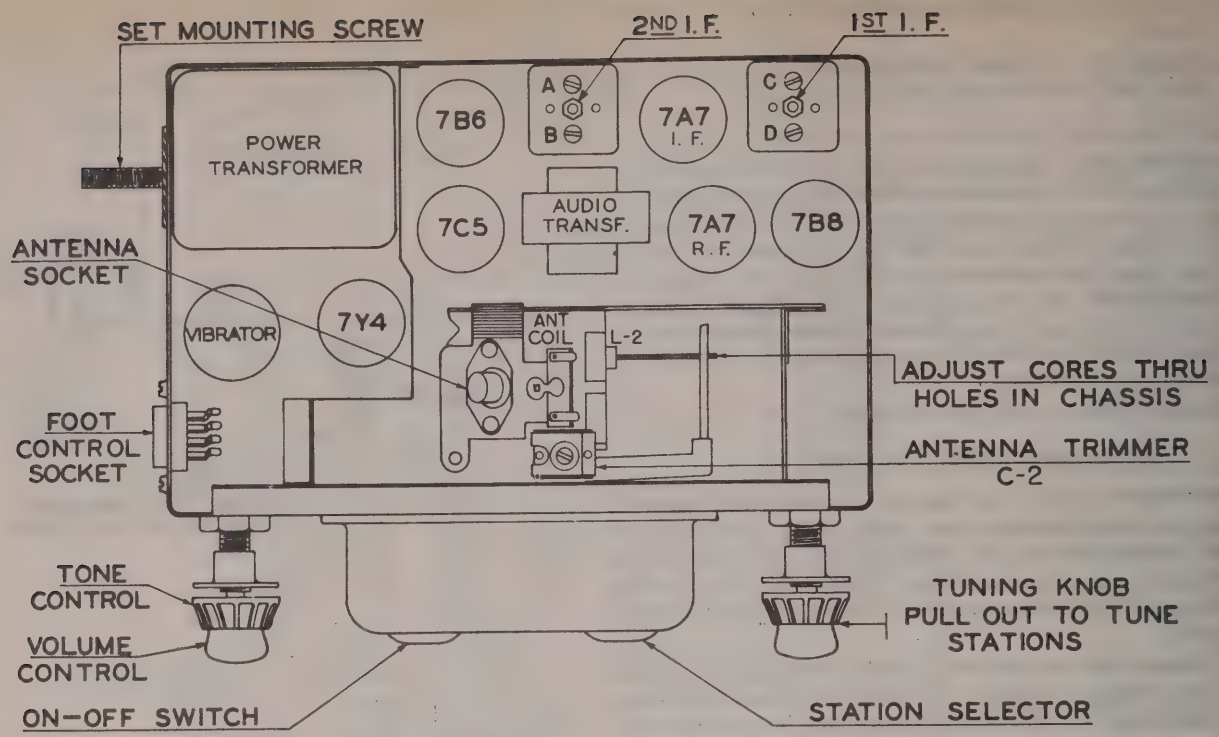


Fig. 9. Top View of Chassis

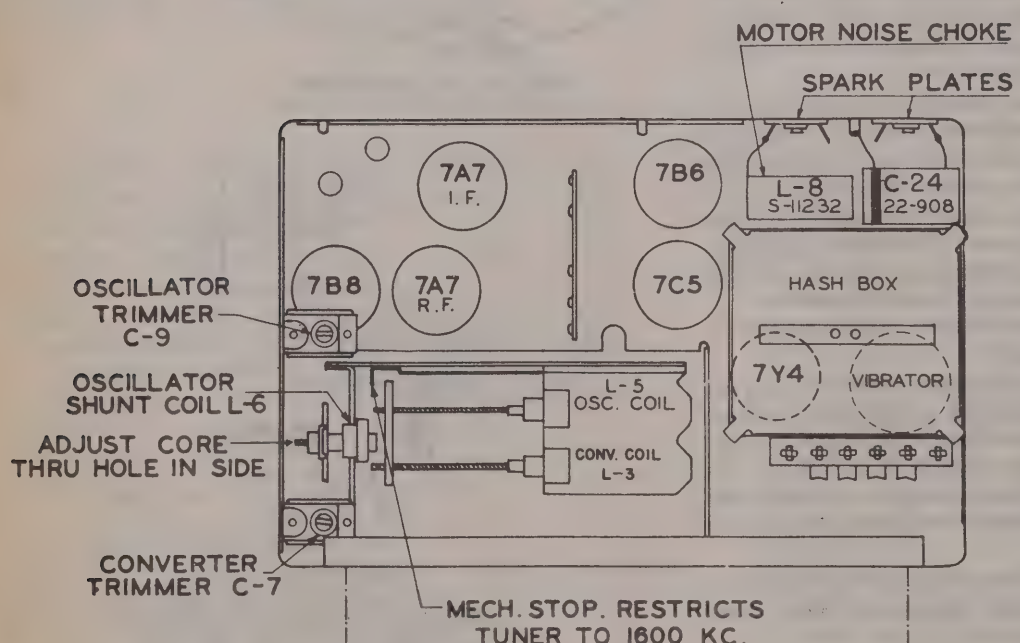


Fig. 10. Bottom View of Chassis

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; so follow these instructions carefully.

CAUTION: Make all adjustments on the receiver with volume control set at maximum. Reduce signal intensity as much as possible at signal generator. Connect output meter across voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C and D (Fig. 9), in the order named for maximum output. Repeat the operation to assure accurate alignment.

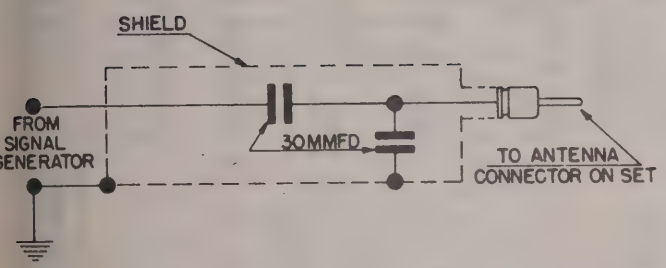


Figure 11. Dummy Antenna

Figure 11 shows the schematic of a recommended dummy antenna closely resembling actual antenna capacity to be used when aligning the R.F. section of the receiver.

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy illustrated in figure 11 to antenna lead in socket on receiver.
2. Set signal generator to 535 Kc.
3. Place set in manual tuning position and set dial to 535 Kc.
4. Adjust oscillator trimmer C-9 (Fig. 10) for maximum response.
5. Set signal generator to 1200 Kc.
6. Tune set to 1200 Kc.
7. Adjust converter trimmer C-7 (Fig. 10) and antenna trimmer C-2 (Fig. 9) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

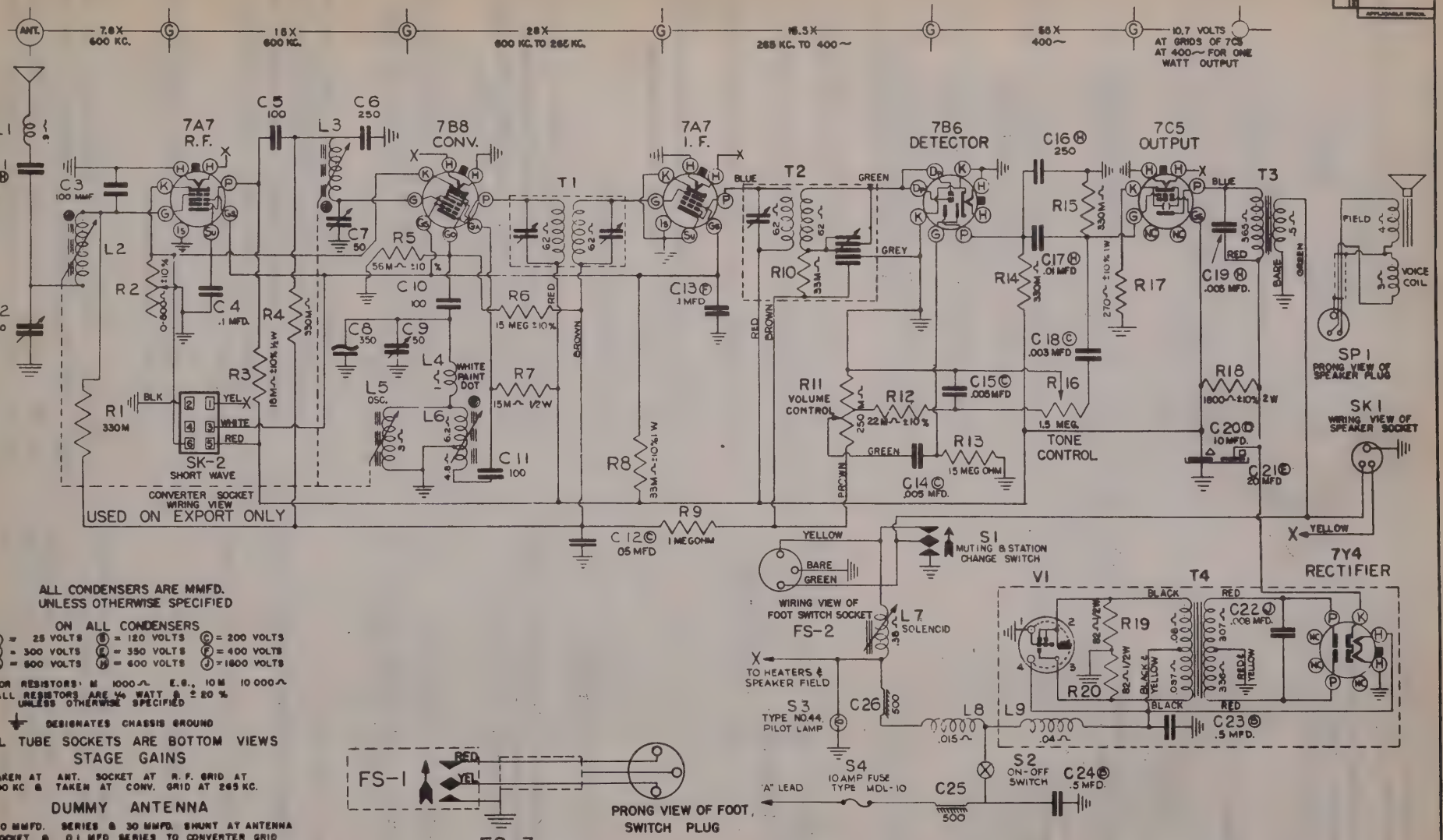
CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

1. Replace coil or core.
2. Set signal generator to 1700 Kc.
3. Connect signal generator leads through dummy illustrated in figure 11 to antenna receptacle on the receiver.
4. Set receiver dial to 1600 KC. (Maximum high frequency end of dial.)
5. Screw the core completely out of the antenna coil, the converter coil, and the oscillator coil.
6. Adjust oscillator trimmer C-9 (Fig. 10) at 1700 Kc.
7. Adjust converter trimmer C-7, and antenna trimmer C-2 (Fig. 9 and 10) for maximum output reading.
8. Replace cores to their approximate original positions.
9. Set generator dial and receiver dial to 1200 Kc.
10. Adjust oscillator core L-5 (Fig. 10) to scale at 1200 Kc.
11. Adjust the antenna core, L-2 and converter core L-3 (Fig. 9 and 10), for maximum output reading.
12. Set signal generator to 600 Kc.
13. "Rock in" Shunt oscillator coil L-6 (Fig. 10) for maximum output reading. (This should only be done as a last resort.) This is the same as rocking in the padder condenser on a ganged condenser receiver.
14. Check receiver at 1200 Kc. for calibration and gain. If receiver is off scale or weak, repeat operations 9, 10 and 11.
15. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc. the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

    After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in car allow it to operate for approximately 15 minutes in order for each part to reach normal operating temperature. Extend the antenna to maximum and align the antenna trimmer C2 on a weak station near 1200 Kc.



ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED

ON ALL CONDENSERS

Ⓐ = 25 VOLTS Ⓑ = 120 VOLTS Ⓒ = 200 VOLTS
Ⓓ = 300 VOLTS Ⓔ = 350 VOLTS Ⓕ = 400 VOLTS
Ⓖ = 500 VOLTS Ⓗ = 600 VOLTS Ⓙ = 1600 VOLTS

FOR RESISTORS: M 1000Ω E.G., 10M 10 000Ω
ALL RESISTORS ARE ½ WATT & ± 20 % UNLESS OTHERWISE SPECIFIED

⏚ DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANT. SOCKET AT R.F. GRID AT 600 KC & TAKEN AT CONV. GRID AT 265 KC.

DUMMY ANTENNA

30 MMFD. SERIES & 30 MMFD. SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL.

VOLTAGES TO READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

SCHEMATIC DIAGRAM FOR 6 TUBE WITH FOOT CONTROL

DB-47

I. F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.

PARTS LIST

HUDSON DOMESTIC AUTO RADIO PART No. HA206990

Zenith Model 6MH089 (Chassis 6C89)

RADIO RECEIVER KIT
Model DB-47

Radio receiver
Screws, lockwashers, knobs
Foot selector switch assembly
Speaker and bracket assembly
Distributor suppressor
Voltage regulator condenser
Temperature gauge condenser
Ignition coil condenser
Motor hood bonding spring
Support bracket and attaching parts
Ground strap and attaching parts

RADIO ANTENNA KITS

Part No. 209558—60" Telescopic Antenna including all installation parts.

Part No. 209762—90" Telescopic Antenna including all installation parts.

Part No. 205451—Vacuum Operated Antenna including all installation parts.

NOTE: The above kits are not available from the radio manufacturer. See your Hudson dealer.

COILS AND CHOKES

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
L9	20-213	204890	Main Hash Choke	.35
T1	95-916	209569	1st I.F. Transformer	1.75
T2	95-942	207301	2nd I.F. Transformer	2.05
L1	S-8819	209741	Antenna Motor Noise Choke Assembly	.26
L4	S-11229	209568	Oscillator Series Coil Assembly	.30
L8	S-11232	209571	Motor Noise Choke Coil Assembly	.22
L3, L5	S-11041	206668	Left Hand Coil and Shield Assembly (Osc. & Converter)	2.09
L6	S-13646	206657	Oscillator Shunt Coil Assembly	1.80
L2	S-13650	206669	Right Hand Coil and Shield Assembly (R.F.)	1.50

CONDENSERS

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
C5, C10, C11	22-162	204900	100 Mmfd. 600 V.	.20
C13	22-170	204901	.1 Mfd. 400 V.	.26
C16	22-182	204902	250 Mmfd. 600 V.	.26
C4	22-190	209577	.1 Mfd. 200 V.	.23
C12	22-250	204904	.05 Mfd. 200 V.	.20
C3	22-365	206741	100 Mmfd. 500 V.	.20
C19	22-838	204905	.005 Mfd. 600 V.	.20
C14, C15	22-906	204906	.005 Mfd. 200 V.	.20
C23, C24	22-908	204907	.5 Mfd. 120 V.	.33
C6	22-1136	209585	250 Mmfd. 600 V.	.20
C1, C17	22-1170	204910	.01 Mfd. 600 V.	.20
C18	22-1180	209587	.003 Mfd. 200 V.	.20
C7	22-1377	209582	Detector Trimmer	.33
C9	22-1378	209581	Oscillator Trimmer	.32
C22	22-1448	209579	.008 Mfd. (or 22-1651) 1600 V.	1.00
C8	22-1478	209919	350 Mmfd. Compensator	.32
C20, C21	22-1644	206742	Two Section Electrolytic 10 Mfd.—300 V.X 20 Mfd.—350 V. (or 22-1554)	1.38
C2	22-1679	206660	Antenna Trimmer	.45

RESISTORS

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
R18	63-1368	209920	1800 Ohm W.W. 2 Watt	.33
R17	63-1369	209921	270 Ohm W.W. 1 Watt	.22
R2	63-1379	207877	Sensitivity Control	.35
R9	63-1390	209922	1 Megohm ¼ Watt	.19
R1, R4, R14, R15	63-1392	209923	330M Ohm ¼ Watt	.19
R12	63-1395	206743	22M Ohm ¼ Watt	.19
R8	63-1398	209928	33M Ohm 1 Watt	.24
R19, R20	63-1399	209929	82 Ohm ½ Watt	.21
R13	63-1400	209930	15 Megohm ¼ Watt	.19
R7	63-1401	209931	15M Ohm. ½ Watt	.21
R6	63-1406	206661	15 Megohm ¼ Watt	.19
R3	63-1411	208000	18M Ohm ¼ Watt	.21
R5	63-1431	206744	56M Ohm ¼ Watt	.19
R11	63-1539	206996	Volume and Tone Control (or 63-1334)	3.01

MISCELLANEOUS

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
	52-202	204935	Battery Cable (Set to Fuse)	.19
	52-254	209551	Battery Cable (Fuse to Ammeter)	.24
	52-279	209968	Speaker Cable & Plug	.96
	52-294	206745	Volume Control Cable	.85
	78-281	209745	Vibrator Socket	.12
	78-596	209746	Loktal Base Tube Socket (8 contact)	.18
FS-2	78-646	206997	Foot Switch Cable Plug Socket	.21
S2	85-339	209747	On-Off Switch	.55
	93-456	209748	Vibrator Cushion Washer	.02
T4	95-1023	206662	Power Transformer (or 95-1024)	7.00
T3	95-1026	206663	Output Transformer	2.50
	136-12	18269	Fuse—20 Amp.	.12
V1	190-20	209686	Vibrator	3.85
	202-548	206665	Installation Instruction Book	.10
S1	S-11270	206658	Hand Selector & Muting Switch Assembly	.67
	S-11310	209934	Antenna Socket, Bracket & Terminal Strip Assembly	.43
FS-3	S-13246	206994	Foot Switch Assembly	3.40

SPEAKER AND MOUNTING COMPONENTS

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
	12-937		Speaker Support	
		204020	Bracket	.25
SP1	49-538		6" Dynamic Speaker (Field Coil Not Replaceable)	
		208826		7.00
SP1	49-586		6" P.M. Speaker	
		206666	(Alt. for 49-538)	7.00
	54-30		8-32 x 5/16 x 7/64	
		170567	Hex Nut	.01
	57-945		Speaker Cover	
		204022	Plate	.90
	114-88		8-32 x 1/2" Hex Hd.	
		205287	Machine Screw	.01
	114-167		#10-32 x 5/16" Hex Acorn Hd. Machine	
		205288	Screw	.01
	196-53		Rubber Speaker	
		204024	Gasket	.48

DIAL AND TUNING MECHANISM ASSEMBLY

	26-337		Dial Scale (Manual	
		209682	Tuning)	.22
	34-132	209691	Indexing Disc	.02
	34-145	209693	Indicator Drive Gear	.11
	34-158	206664	Ratchet Gear	.34
	46-581	209553	Selector Knob (2 used)	.20
	57-1061	209560	Escutcheon	4.40
	57-1151	209694	Name Plate	.10
	59-158	204040	Dial Pointer	.46
	80-329	209695	Gear Indexing Spring	.03
	80-331		Cross Arm Return	
		209681	Spring	.04
	80-332	209696	Cam Lever Spring	.03
	80-336		Ratchet Gear Return	
		209697	Spring	.01
	80-340	209698	Lever Spring	.01
	80-341	209699	Kick-Off Spring	.01
	80-342	209700	Tuning Shaft Spring	.01
	80-343	209701	Solenoid Switch Spring	.01
	80-344		Solenoid Switch Con-	
		209702	tact Spring	.03
	80-425	209703	Knob Return Spring	.07
S3	100-36		Dial Light Bulb—	
		171113	Mazda Type #44	.10
	149-44		Adiusting Spring and	
		209799	Core	.40

Zenith Part No.	Hudson Part No.	Description	Price
188-45		Turret Screw Lock	
	209705	Ring	.02
S-10826		Solenoid End Plug and	
	209706	Bracket Assembly	.30
S-10829		Solenoid and Terminal	
	209567	Assembly	.79
S-10831		Ratchet and Bracket	
	209707	Assembly	.63
S-11052		Tuning Shaft and	
	204025	Gear Assembly	1.34
S-11082	209709	Turret Assembly	3.34
S-11313		Dial Drum and Bracket	
	209738	Assembly (35-9)	.99
S-11494		Mounting Plate and	
	209739	Lever Assembly	.59
S-11976		Dial Light Socket and	
	209740	Wire Assembly	.27
S-13649	206656	Cross Arm Assembly	1.10

INSTALLATION PARTS AND KNOBS

		Complete	5.50
S-13413	206659	Installation Kit—	
22-1260		Temperature Gauge	
	152021	Condenser	.38
22-1537		Generator & Ignition	
	208592	Coil Condenser	.77
46-459	205293	Tone Control Knob	.19
54-173		Set Mounting Nut	
	205283	(Trim Washer)	.24
54-174	205289	1/4-20 Wing Nut	.03
63-1252	205281	Distributor Suppressor	.48
80-145		Motor Hood Bond	
	205282	Spring	.02
112-310		Foot Switch Mounting	
	170687	Screw	.02
112-365		#8 x 1/2" B.H.S.M.	
	170304	Screw	.01
S-12271		Tuning Control & Trim Knob Assembly	
	209936	(46-550 and 584)	1.28
S-12272		Volume Control Knob & Spring Assembly	
	209937	(46-549)	.26

Prices Subject to Change Without Notice.

PARTS LIST Zenith Model 6MHO89E (Chassis 6C89E) (DB47)

HUDSON EXPORT AUTO RADIO PART No. HA-206991

The parts listed for radio, part number HA 206991, is the same as for part number HA 206990 with the following parts omitted and added.

ADD

Diag. No.	Zenith Part No.	Description	Price
SK2	52-419	Short wave Converter cable and socket	
T3	95-1027	Output transformer	2.70
	202-549	Instruction Book	.10

OMIT

Diag. No.	Zenith Part No.	Description	Price
T3	95-1026	Output transformer	2.50
	202-548	Instruction Book	.10

Printed in U. S. A.

SERVICE MANUAL

FOR

HUDSON AUTOMOBILE RECEIVER

SPECIFICATIONS AND CIRCUIT FEATURES

MODEL 6MH889—CHASSIS 6E89

TUBE COMPLEMENT: 7A7 R.F., 7B8 Converter, 6BA6 I.F., 7B6 Detector, A.V.C., 1st Audio, 6V6GT Beam Power Output, 7Y4 Rectifier.

TUNING RANGE: 540 to 1600 Kilocycles.

AUTOMATIC POSITIONS: 6.

SPEAKER: 6″ x 9″ Oval Permanent Magnet externally mounted behind instrument panel. Voice coil impedance 3.2 ohms at 400 cycles.

TONE CONTROL: Continuously variable.

POWER OUTPUT: Maximum 4.5 watts. Measured at voice coil.

VIBRATOR: Non-synchronous.

POWER RATING: Current drain 6 amperes.

FUSE: 14 amperes. Type SFE-14.

SENSITIVITY: 4 Microvolts at one watt output.

I.F. FREQUENCY: 265 Kilocycles.

WARRANTY AND SERVICE

The DB48 Hudson Receiver is covered by warranty against defect in material and workmanship for a period of 90 days after retail delivery.

This warranty covers a receiver installed at the factory or a receiver installed in the field as an accessory.

IMPORTANT

A warranty registration tag is furnished with each receiver. This tag must be filled in and attached to the unit at the time of retail delivery and must accompany the receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail. All warranty labor claims must be made to the Hudson Dealer. Do NOT send claims to the radio manufacturer. Defective parts in warranty will be replaced, no charge to you, by the nearest Zenith Distributor.

OPERATING INSTRUCTIONS

OFF-ON SWITCH AND VOLUME CONTROL

To turn the receiver on, turn the volume control knob to the right until it clicks and the dial is illuminated. Allow the receiver to reach operating temperature. (Approximately 20 seconds.) To increase the volume, continue to turn this control knob to the right. To turn the receiver off turn the volume control knob to the left until it clicks.

TONE CONTROL

The tone control is located directly behind the volume control knob (Fig. 1). Rotating this control to the right or left will change the tone of the receiver. Tuning to the right will emphasize the high notes, while turning to the left will emphasize the bass notes.

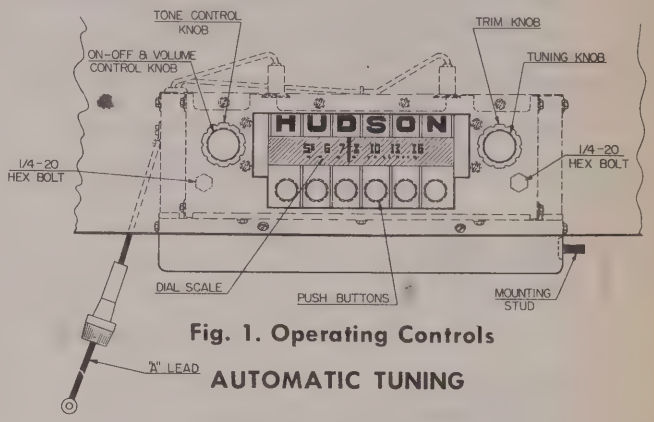


Fig. 1. Operating Controls

AUTOMATIC TUNING

There are six automatic tuning positions, each of which may be adjusted to any desired station. In order to simplify the identification of the stations, it is advisable to set the automatic tuning mechanism in sequence according to frequencies of the stations, beginning with the station broadcasting on the lowest frequency, and progressing to the station broadcasting on the highest frequency. If the positions have not been previously adjusted, proceed as follows:

1. Loosen the first push button by turning it counter-clockwise with your fingers, not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may fall apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.

2. Turn the manual tuning control knob (Fig. 1) to tune in the desired station. Carefully tune to the middle of the signal for clearest reception.

3. Push the first push button in as far as it will go. Release the button, and tighten securely by turning it clockwise with the fingers.

4. Repeat the above procedure for the remaining five push buttons.

MANUAL TUNING

To tune manually it is only necessary to turn the manual tuning knob (on the right side of the receiver, see Fig. 1). Tune to exact frequency for the best tone quality. This can be done at any time without disturbing the automatic setting.

Printed in U.S.A.—5M—3-48—C. P.

Form H48

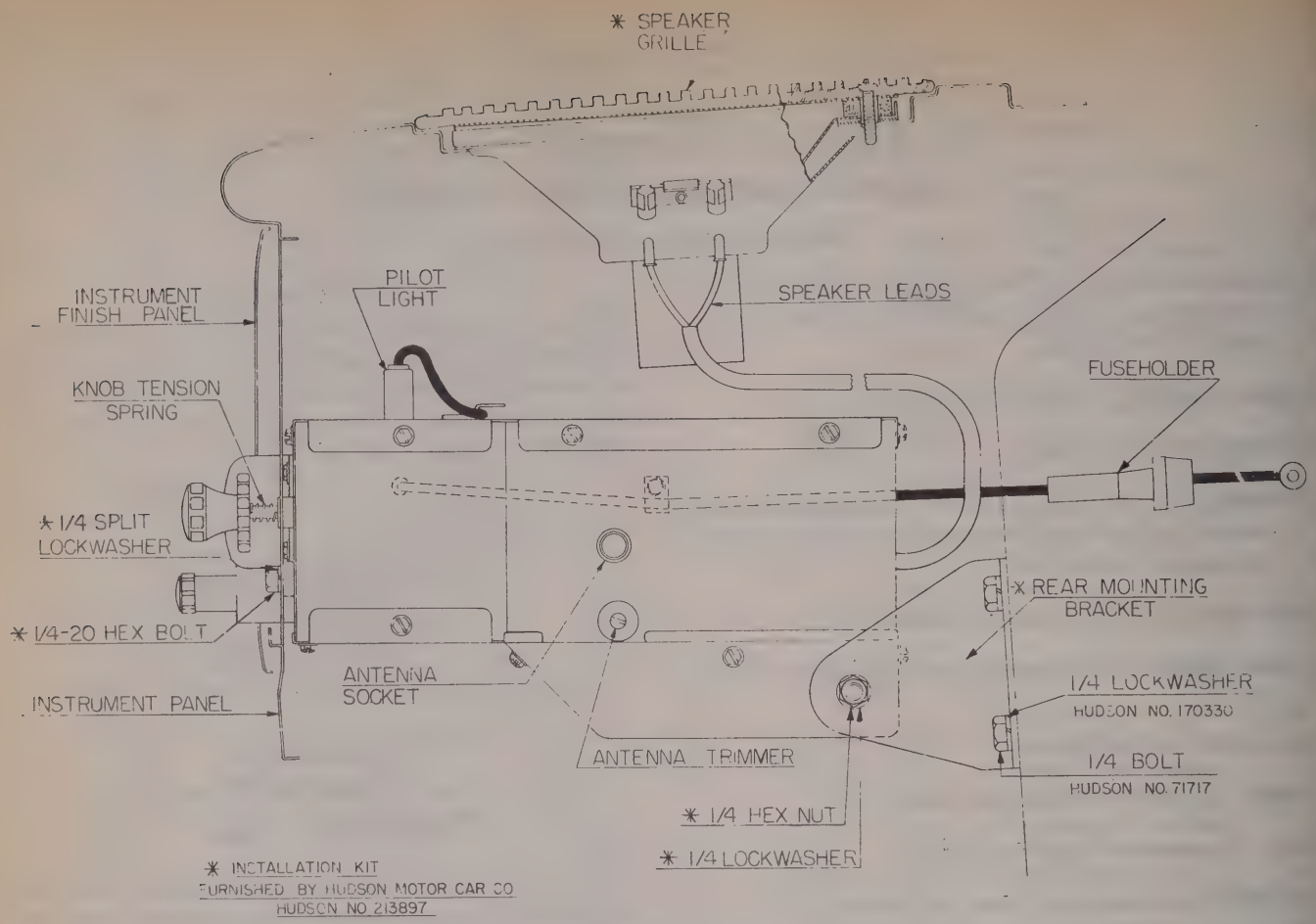


Fig. 2. Mounting Details and Connections

INSTALLATION INSTRUCTIONS

1. Install the antenna. (Complete instructions are furnished with each kit.)

2. Remove door on left hand side of instrument panel by removing the three screws from the back.

3. Remove ornament from center of trim panel above radio opening by means of removing the two face screws.

4. Remove the instrument finish panel and remove the escutcheon plug from the panel.

5. Remove the two bolts, Hudson No. 71717, from the fire wall and install the rear mounting bracket No. 12-1410. Do not tighten the bracket at this time. (Fig. 2.)

6. With the dial end of the receiver up, push the receiver up between the instrument panel and the air hopper. Turn the radio until the knob shafts slide through the openings in the instrument panel and the tapped spacers provided on the front plate of the set line up with the two corresponding holes in the instrument panel. Bring the receiver forward as far as it will go. (Fig. 2.)

7. With the receiver held in this position start the two ¼ x 20 x ½ fillister head screws, with lockwashers, into the holes.

8. Slip the elongated hole in mounting bracket over the stud on the set and install lockwasher and nut.

9. Before locking the receiver securely in position, place the instrument finish panel into position over the clock and speedometer and note whether or not the radio and trim panel are centered correctly. If not, move the radio until the dash trim panel and radio dial escutcheon assembly are in alignment. Then permanently fasten set in position by tightening the two front screws and the nut and bolts on the rear mounting bracket. Replace instrument finish panel and fasten securely.

10. Connect the "A" lead of the set to the battery terminal of the circuit breaker, mounted on the instrument panel brace over the steering column (Fig. 3).

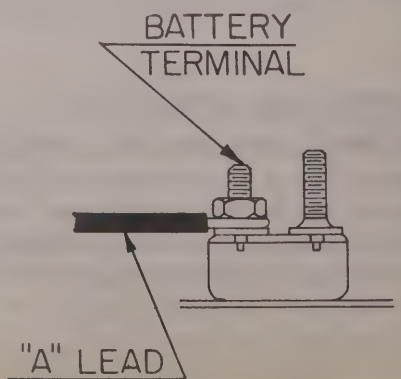


Fig. 3

11. Plug in antenna cable (Fig. 2).
12. Remove speaker cover plate, and pull speaker leads through opening in dash.
13. Plug speaker leads into pin jack mounted on speaker. Make sure green lead plugs into green spotted pin jack.
14. Lower speaker into position, and line up with holes in the instrument panel. Place speaker grille, included in radio package, over speaker, making sure the mounting holes line up, then fasten securely with the four chrome plated screws provided in kit.
15. Place tone control knob onto shaft, put on volume control knob, tighten set screw (Fig. 1). Be sure there is no binding.
16. Place knob tension spring No. 80-594 over the tuning shaft. Put on trim ring and press on tuning control knob as far as it will go. Tighten set screw (Fig. 1).
17. Replace ornament and door.
18. **IMPORTANT:** Turn the receiver on and allow it to operate for approximately fifteen minutes in order for it to reach normal operating temperature. Tune in a weak station near 1200 Kc. With a small screw driver adjust the antenna trimmer, located on the right side of the receiver for maximum volume (Fig. 2).

INTERFERENCE ELIMINATION

IMPORTANT: Use the utmost care in the following operations to insure freedom from motor noise. Be sure that good ground contacts are made between the interference condensers and the car body. If necessary, clean away paint or dirt with emery paper. Tighten all nuts and bolts securely.

1. Remove the mounting screw of the voltage regulator and under this screw mount the condenser No. 22-1537. Connect the lead to the voltage regulator "A" terminal. (Fig. 4.)
2. Install suppressor No. 63-1252 in center of hole of distributor cap. Place high tension lead in top of suppressor. Be sure the suppressor and the lead are fastened securely. (Fig. 5.)
3. Remove bolt on the right side of the ignition coil. Mount condenser No. 22-1537 under this bolt. Connect lead to coil terminal marked (—). (Fig. 6.)

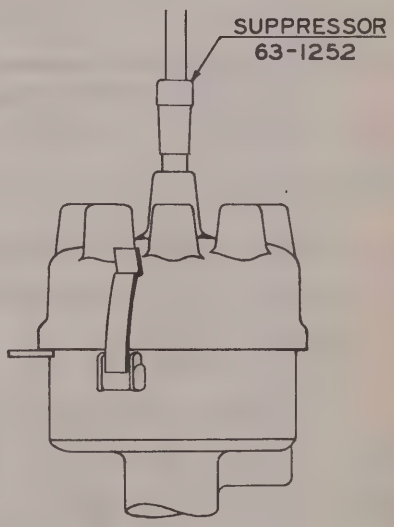


Fig. 5

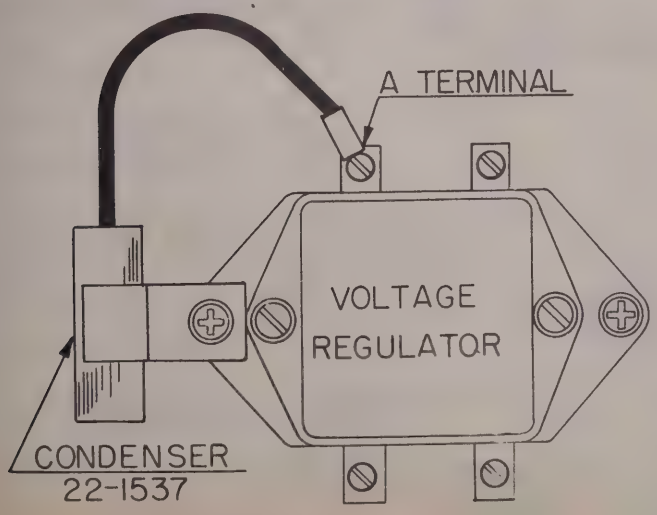


Fig. 4

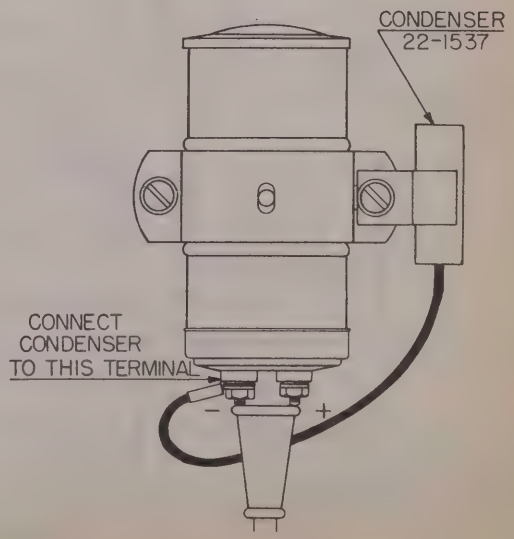


Fig. 6

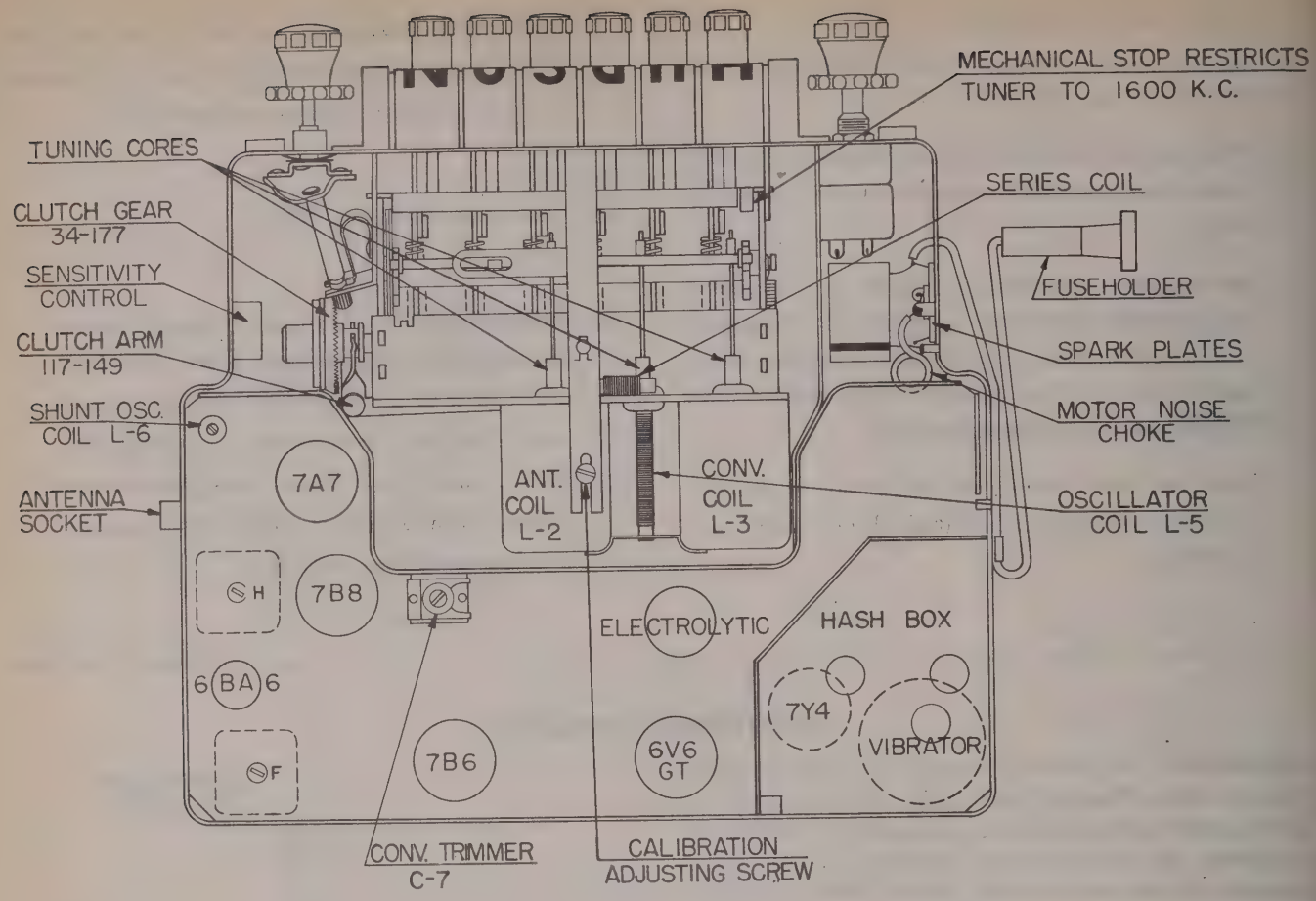


Fig. 7. Top View of Chassis

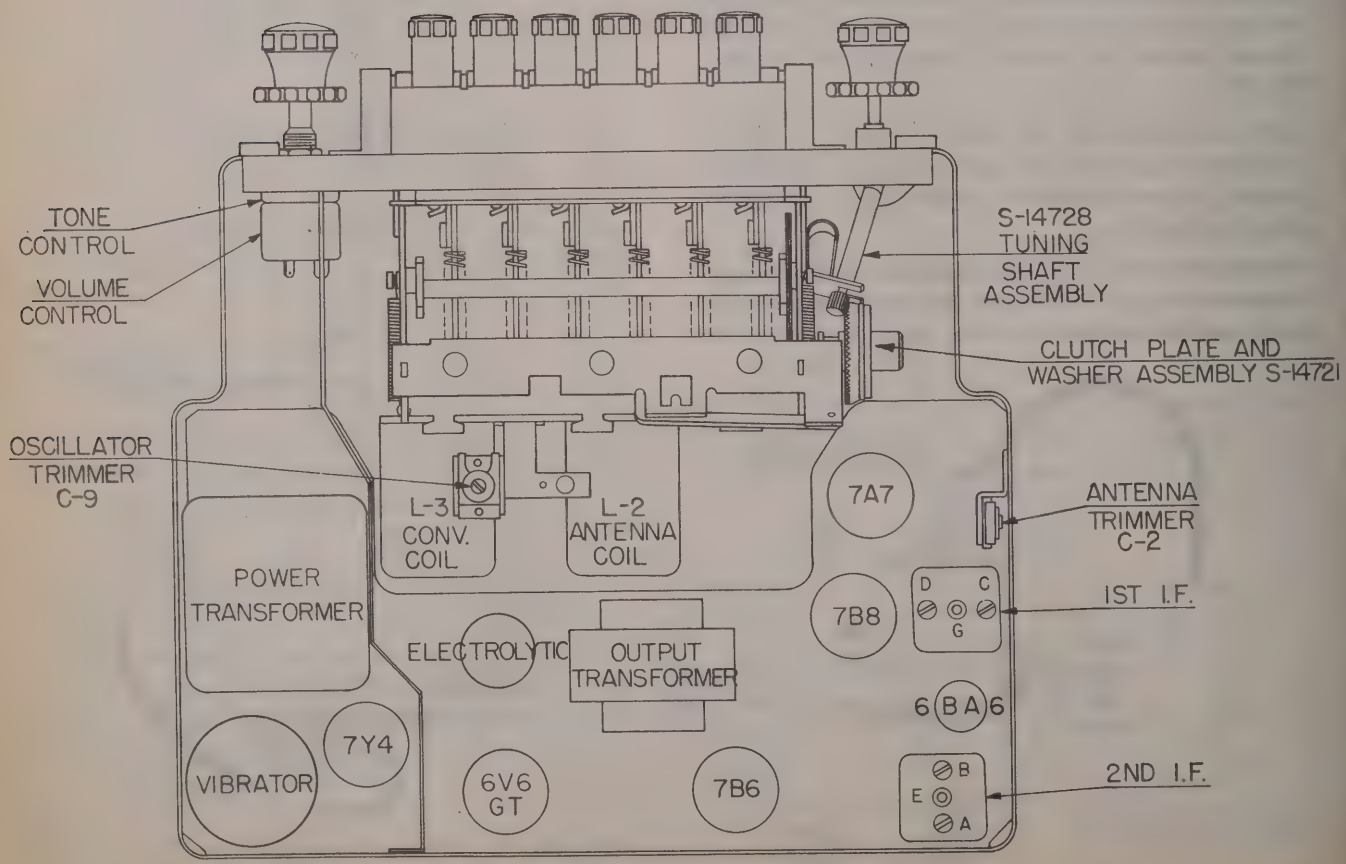


Fig. 8. Bottom View of Chassis

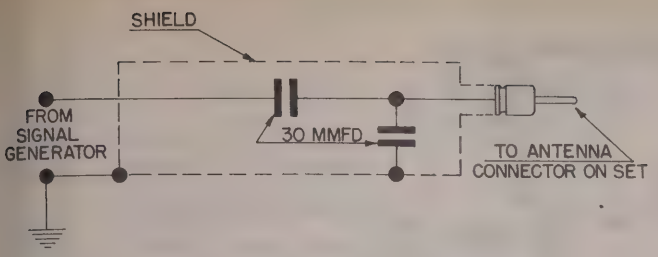


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output. Repeat the operation to assure accurate alignment. Some units have I.F. transformers that, are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named for maximum output and repeat the operation to assure accurate alignment. (Figs. 7-8.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-9 (Fig. 8) for maximum response.
5. Set signal generator to 1400 Kc.
6. Tune set to 1400 Kc.
7. Adjust converter trimmer C-7 (Fig. 8) and antenna trimmer C-2 (Fig. 7) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 7.)

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

The steel clamp collar normally grips the core spring and before a core is screwed in or out this tension must be released.

TO REMOVE CORE:

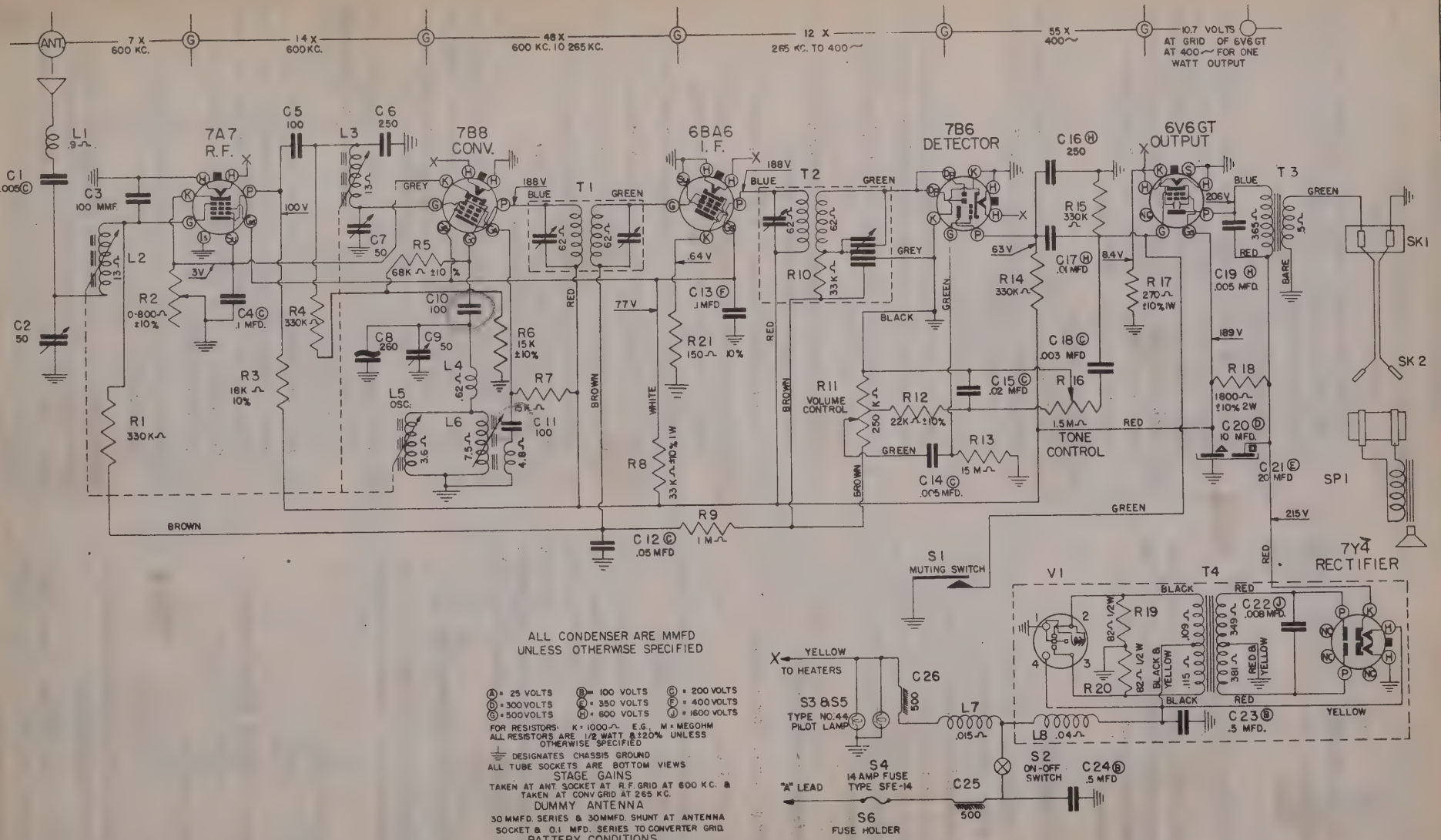
Remove the steel clamp collar using stubby nosed pliers by pressing the lugs of the collar together. Using core alignment tool, part number S-13064, screw the core spring down to the support bracket. With your fingers, screw the core spring past the bracket and lift out of the coil.

TO REPLACE CORE:

Place the core in the coil, screw the core spring into and past the support bracket. Use core tuning wrench, part number S-13064.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (maximum high frequency end of dial).
4. Screw the cores completely out of the antenna coil, the converter coil, and the oscillator coil.
5. Adjust oscillator trimmer C-9 (Fig. 8) at 1675 Kc.
6. Adjust converter trimmer C-7, and antenna trimmer C-2 (Figs. 7 and 8) for maximum output reading.
7. Replace cores to their approximate original position.
8. Set signal generator dial and receiver dial to 1400 Kc.
9. Adjust oscillator core L-5 (Fig. 8) to scale at 1400 Kc.
10. Adjust the antenna core L-2, and converter core L-3 (Fig. 7) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-6 (Fig. 8) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a general condenser receiver.
13. Check receiver at 1400 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.
15. Replace the steel clamp collar over the threaded insulating bushing.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1400 Kc.


ANT.
7 X 600 KC.
14 X 600 KC.
48 X 600 KC. TO 265 KC.
12 X 265 KC. TO 400~
55 X 400~
10.7 VOLTS AT GRID OF 6V6 GT AT 400~ FOR ONE WATT OUTPUT
7A7 R.F.
7B8 CONV.
6BA6 I.F.
7B6 DETECTOR
6V6 GT OUTPUT
7Y4 RECTIFIER
T1
T2
T3
T4
V1
S1 MUTING SWITCH
S2 ON-OFF SWITCH
S3 & S5 TYPE NO. 44 PILOT LAMP
S4 14 AMP FUSE TYPE SFE-14
S6 FUSE HOLDER
SK1
SK2
SP1
TONE CONTROL
VOLUME CONTROL
YELLOW TO HEATERS
"A" LEAD
BROWN
BLUE
GREEN
RED
BLACK
WHITE
GREY
BARE
YELLOW
ALL CONDENSER ARE MMFD UNLESS OTHERWISE SPECIFIED
(A) = 25 VOLTS (B) = 100 VOLTS (C) = 200 VOLTS
(D) = 300 VOLTS (E) = 350 VOLTS (F) = 400 VOLTS
(G) = 500 VOLTS (H) = 600 VOLTS (J) = 1600 VOLTS
FOR RESISTORS: K = 1000Ω E.G., M = MEGOHM
ALL RESISTORS ARE 1/2 WATT & ±20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANT. SOCKET AT R.F. GRID AT 600 KC. & TAKEN AT CONV GRID AT 265 KC.
DUMMY ANTENNA
30 MMFD. SERIES & 30MMFD. SHUNT AT ANTENNA SOCKET & 0.1 MFD. SERIES TO CONVERTER GRID.
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL
VOLTAGES TO READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
SCHEMATIC DIAGRAM FOR 6 TUBE
HUDSON 6MH889
I.F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS
U.S.A.

PARTS LIST

HUDSON DOMESTIC AUTO RADIO PART No. HA213898

Zenith Model 6MH889 (Chassis 6E89)
DB-48 (H. A. 213898)

Zenith Part No.	Hudson Part No.	Description	Price
		COILS AND CHOKES	
20-213	204890	Main Hash Choke	$ .36
95-1087	215456	1st I.F. Transformer (or 95-1077)	1.75
95-1088	215457	2nd I.F. Transformer (or 95-1060)	2.00
S-8819	209741	Antenna Motor Noise Choke Assembly	.40
S-11232	209571	Motor Noise Choke Coil Assembly	.22
S-14219	215458	Tuner Coil Unit Assembly (Ant., R.F. and Osc.)	4.75
S-14225	215459	Oscillator Shunt Coil Assembly	.80
S-14226	215460	Oscillator Series Coil Assembly	.35
S-14227	215462	Antenna Coil Assembly	.90
S-14227	215462	R.F. Coil Assembly	.90
S-14228	215461	Oscillator Coil Assembly	.75
		CONDENSERS	
22-170	204901	.1 Mfd. 400 V.	.26
22-182	204902	250 Mmfd. 500 V.	.26
22-190	209577	.1 Mfd. 200 V.	.23
22-250	204904	.05 Mfd. 200 V.	.20
22-365	215465	100 Mmfd. 500 V.	.20
22-838	204905	.005 Mfd. 600 V.	.20
22-906	204906	.005 Mfd. 200 V.	.20
22-1136	209505	250 Mmfd. 500 V.	.20
22-1170	204910	.01 Mfd. 600 V.	.20
22-1180	209587	.003 Mfd. 200 V.	.20
22-1270	215465	.02 Mfd. 200 V.	.20
22-1448	209579	.008 Mfd. 1600 V.	1.00
22-1644	215466	Electrolytic—20 Mfd. 350 V. x 10 Mfd. 300 V. (or 22-1554)	1.60
22-1712	215467	260 Mmfd. Compensating	.50
22-1714	215468	Single Section Trimmer (Antenna—50 Mmfd.)	.35
22-1715	215469	Single Section Trimmer (Converter—50 Mmfd.)	.35
22-1716	215470	Single Section Trimmer (Oscillator—50 Mmfd.)	.35
22-1728	215471	.5 Mfd. 100 V.	.55
22-1730	215472	100 Mmfd. (Ceramic) 500 V.	.20

Dia. No.	Zenith Part No.	Hudson Part No.	Description	Price
			RESISTORS	
R2	63-1379	209877	Sensitivity Control (or 63-1267)	$ .56
R8	63-1398	209929	33M Ohm 1 W.	.24
S2 R11 R16	63-1587	215473	Volume Contol, Switch and Tone Control	3.01
R18	63-1620	215474	1800 Ohm 2 W.	.36
R17	63-1621	215475	270 Ohm 1 W.	.24
R19 R20	63-1740	215476	82 Ohm ½ W.	.21
R21	63-1750	215477	150 Ohm ½ W.	.21
R7	63-1835	215478	15M Ohm ½ W.	.21
R3	63-1838	215479	18M Ohm ½ W.	.21
R12	63-1841	215480	22M Ohm ½ W.	.21
R10	63-1849	215481	33M Ohm ½ W.	.21
R5	63-1862	215482	68M Ohm ½ W.	21
R1 R4 R14 R15	63-1891	215483	330M Ohm ½ W.	.21
R9	63-1912	215484	1 Megohm ½ W.	.21
R6	63-1834	215485	15M Ohm ½ W.	.21
R13	63-1961	215486	15 Megohm ½ W.	.21
			MISCELLANEOUS	
	19-158		I.F. Transformer Mtg. Clip	.04
SP1	49-623	213880	P.M. Speaker (6" x 9" Oval Type) (S-14205)	7.75
	52-455	215489	Volume Control Cable	.70
	52-452	213873	Battery Cable—Fuse to Ammeter (or 52-474)	.50
	52-472	215488	Speaker Cable and Plug	.25
	52-473	215487	Battery Cable—Fuse to Set	.35
	74-49	213881	Speaker Screen	.75
	78-596	215490	Loktal Tube Socket (4 used)	.18
	78-782	215492	Miniature Tube Socket	.25
	78-796	215493	Antenna Connector Socket	.20
	78-801	215491	Octal Tube Socket	.15
	78-804	215494	Vibrator Socket	.20
	93-888	215486	Vibrator Cushion Washer	.04
T3	95-1030	215497	Output Transformer	2.50
T4	95-1066	215498	Power Transformer	7.25
	125-16	171277	Rubber Grommet	.03
	125-63	171273	Rubber Grommet (3 used on S-14219)	.03
	114-199	171252	6-32 x 3/16" Hex. H.D. Slotted S.T. Screw	.01

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
	126-553	215499	Miniature Tube Shield	$ .11
	138-24	211640	Speaker Grille (Hudson No. 211640)....Supplied by Hudson	
	149-62	215436	Iron Core and Screw (used on S-14225)	.10
V1	190-22	215495	Vibrator	4.15
	202-562	213879	Instruction Book (Owner's Manual)	.10
	202-591	215438	Noise Suppression Supplement Sheet	.05
	S-14205		Speaker and Screen Assembly	9.25
	S-14210	215439	Case Cover Set Mtg. Stud and Spring Assembly	.95
	S-14458	213897	Installation Parts Kit (Hudson No. 213897). Supplied by Hudson	
			INSTALLATION PARTS	
	S-14203	213898	Installation Kit—Complete	1.50
	46-698	213896	Trim Knob	.35
	46-699	213895	Tone Control Knob	.35
	52-452	213873	Battery Cable—Fuse to Ammeter	.50
	80-594	213894	Knob Tension Spring	.01
S4	136-11	170480	14 Ampere Fuse—Type SFE-14	.12
			DIAL AND TUNING MECHANISM ASSEMBLY	
	S-14756	215434	Push Button Knob Assembly (6 required)	.65
	26-391	215440	Dial Scale	.90
	56-228	215442	Cross Arm Guide Rod	.15
	57-1340	215443	Escutcheon	3.00
	57-1341	215445	Escutcheon Window Retaining Plate	.30
	59-207	215446	Dial Pointer	.30
	80-379	215447	Pointer Retaining Spring	.03
	80-586	215455	Cross Arm Tension Spring (2 used)	.07
	80-594	213894	Knob Tension Spring	.01
	80-625	215448	Pointer Link Tension Spring	.08

Diag. No.	Zenith Part No.	Hudson Part No.	Description
	93-885	215437	1/32 x .191 x 3/8" Bakelite Washer (2 used on S-14454) $
S3 S5	100-36	171113	Dial Light Bulb—Mazda No. 44
	112-699	171251	No. 4-40 x 3/16" R.H.S.T. Screw—Stan-Tap-Cad. Pl. (57-1341)
	149-63	215453	Iron Core and Screw (3 used)
	192-114	215444	Escutcheon Window
	S-14212	215449	Tuner Unit Assembly 12
	S-14215	215451	Pointer Bracket and Stud Assembly
	S-14216	215452	Pointer Drive Link and Stud Assembly
	S-14217	215453	Dial Light Socket and Wire Assembly
	S-14224	215454	Cross Arm and Bushing Assembly
	S-14721		Clutch Plate and Washer
	S-14728		Tuning Shaft, Pinion Gear and Coupling Assembly
S1	S-14733		Muting Switch Assembly
	17-102		Cam Lock
	34-177		Clutch Gear
	64-162		.088 D x 5/32" Rivet
	73-118		No. 6-32 x 1/4" Hex Head Slotted Set Screw
	80-640		Yoke Tension Spring
	80-641		Clutch Release Bar Spring
	80-642		Clutch Spring
	93-921		Tuning Shaft Steel Washer
	93-922		Tuning Shaft Spring Washer
	93-923		Fishpaper Washer
	97-305		Clutch Arm Stud
	117-149		Clutch Lever
	188-111		Retaining Ring

Prices Subject to Change Without Notice

SERVICE MANUAL

Built for
NASH MOTORS
Division of
Nash-Kelvinator Corp.,
Kenosha, Wis.

ZENITH
LONG DISTANCE AUTO RADIO

For Models
6MN082
6MN088
6MN788
6MN887

Made by ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....4 microvolts at one watt output.

POWER OUTPUT:.....5.5 watts measured at the voice coil.

SPEAKER:.....8" round, instrument panel mounting.

CURRENT CONSUMPTION:.....7.5 amperes

INSTANTANEOUS CURRENT CONSUMPTION DURING AUTOMATIC CHANGE CYCLE:.....20 amperes

TUBE COMPLEMENT:.....7A7 R.F., 7B8 converter, 7A7 I.F., 7B6 detector and 1st audio, 7C5 Power output, 7Y4 rectifier.

IMPORTANT

The warranty tag must be filled in by the car dealer at time of sale and accompany each receiver to be serviced at established warranty rates during the guarantee period. Otherwise regular charges for labor and material prevail. All repairs, whether in or out of warranty, are for the account of the car dealer or customer. DO NOT send claims to the Zenith Radio Corporation.

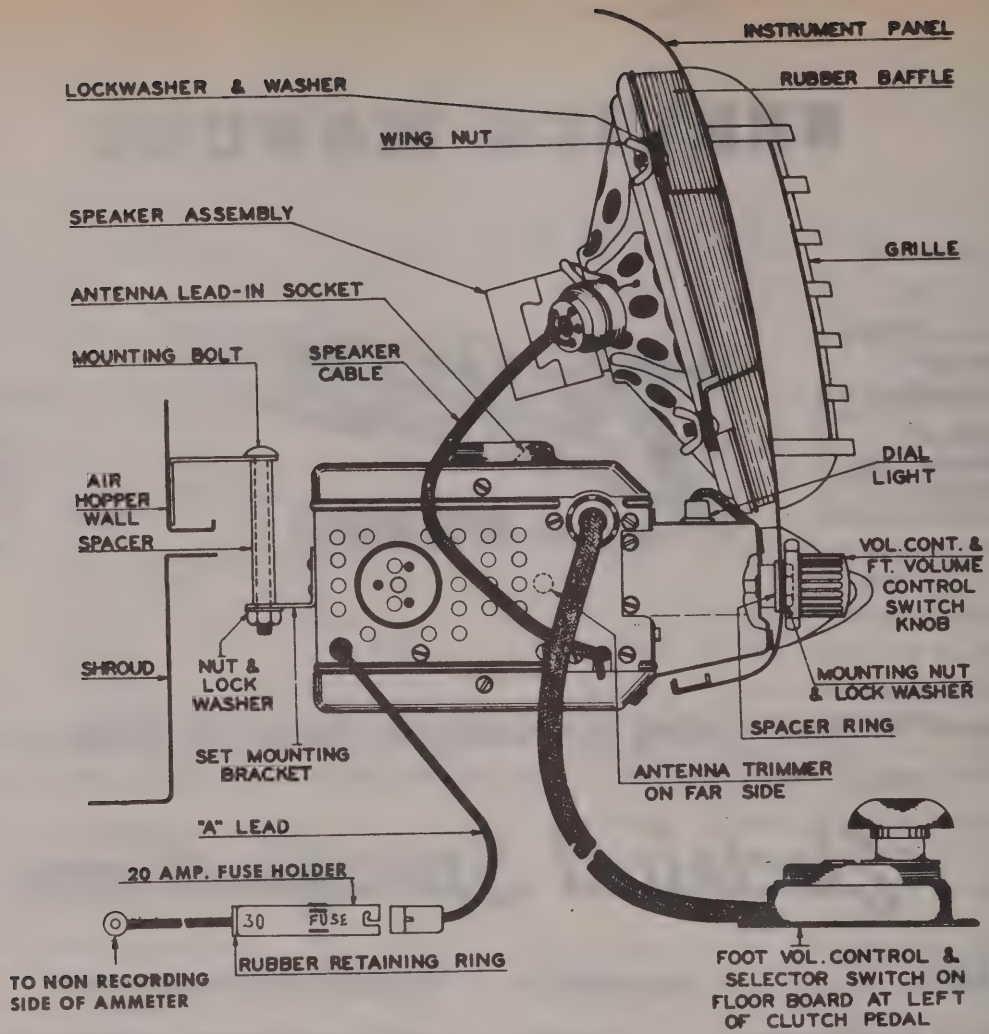


Fig. 1. Installation

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary.

To take the receiver from the car, remove the control knobs and mounting nuts from the front panel, and remove the nut, lock washer, bolt, and spacer from the set mounting bracket.

MANUAL TUNING

1. Press Automatic Tuning Station Selector (Fig. 2) several times or until the letter "M" appears in indicator window.

2. Pull Manual tuning control knob (right hand) outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust left hand control knob for desired volume.

TONE CONTROL—The tone control is located behind the volume control knob. Turn in either direction for most pleasing tone.

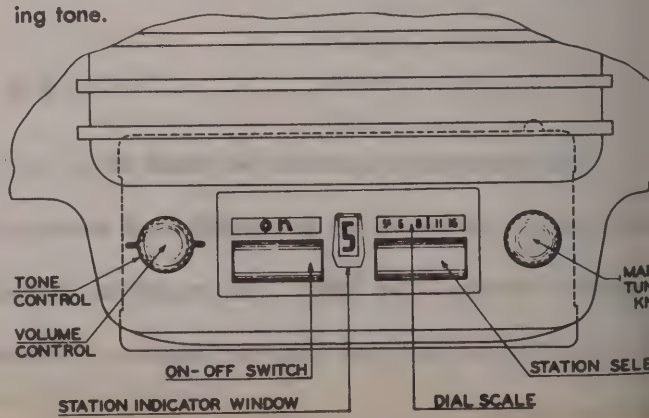


Fig. 2. Front View

AUTOMATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

1. Press station selector bar until number 1 appears in station indicator window.
2. Pull manual tuning knob outward to engage the automatic mechanism.
3. Select the station desired and tune to its frequency by turning tuning knob. Tune very carefully for clearest reception.
4. Press station selector bar, pull manual tuning knob outward, and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the station selector bar to return to dial tuning, or any one of the stations adjusted on the Automatic.

INTERFERENCE SUPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The generator condenser No. 22-920 should be installed as shown below in Figure 3.

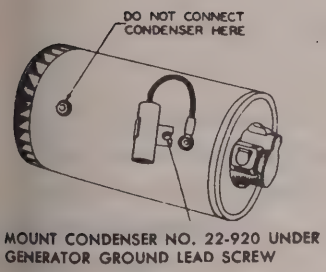


Fig. 3

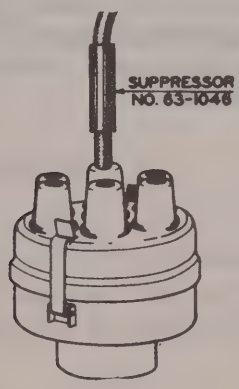


Fig. 4

The distributor supressor No. 63-1046 should be connected as shown above in Figure 4.

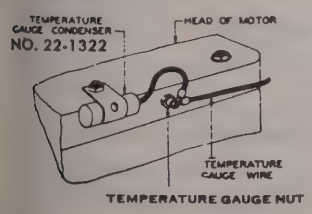


Fig. 5

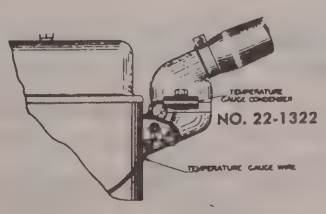


Fig. 6

The No. 22-1322 temperature gauge condenser should be installed as shown in Figure 5 for Nash 600 series cars and Figure 6 for Ambassador cars.

The ammeter and fuel gauge condensers No. 22-919 should be installed as shown in Figure 7.

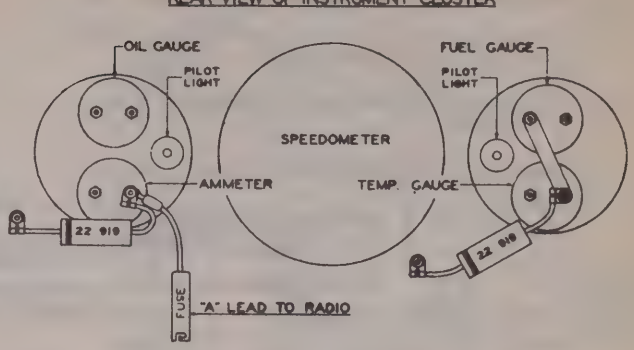


Fig. 7

The motor hood bond spring No. 80-145 should be installed as shown in Figure 8. Note that the sharp extrusions are facing down toward the front of the car before the hood grounding strip is bent back. Make sure the instrument panel bolts and chassis mounting bolts are tight.

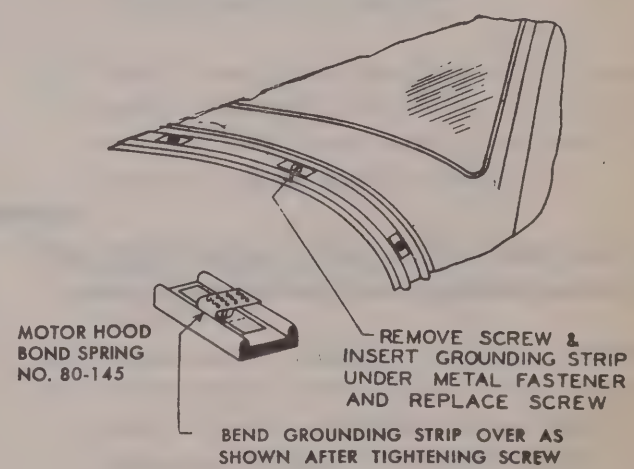

MOTOR HOOD BOND SPRING NO. 80-145
REMOVE SCREW & INSERT GROUNDING STRIP UNDER METAL FASTENER AND REPLACE SCREW
BEND GROUNDING STRIP OVER AS SHOWN AFTER TIGHTENING SCREW

Fig. 8

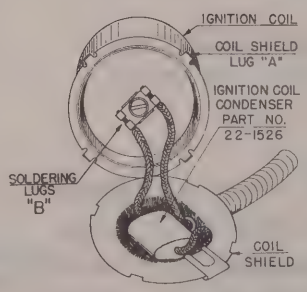


Fig. 9. Ign. Coil Cond.

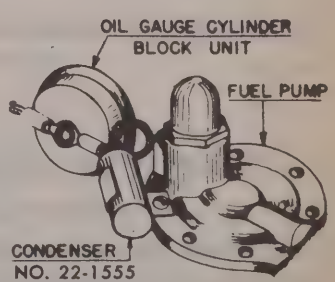


Fig. 9A. Oil Gauge Cond.

Straighten coil shield lugs "A" on back of ignition coil. Remove shield. Condenser should be installed as shown in Fig. 9. When replacing shield be sure to bend lugs down tightly to insure good connection between shield and coil, and be careful that the soldering lugs do not short against the ignition coil. The oil gauge condenser should be installed as shown in Fig. 9A.

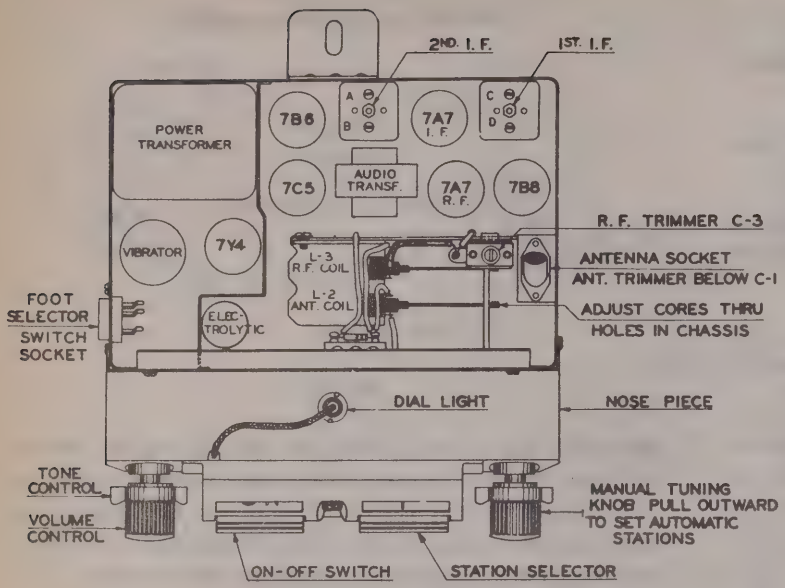


Fig. 10. Top View of Chassis.

Pressing either the Push-bar or the foot control switch automatically mutes the receiver for the duration of the change cycle. This action is accomplished by applying 6 volts negative to the 7B6 first audio grid through the 1 megohm resistor R-22. (See schematic diagram.) This negative voltage blocks off the grid of the 7B6 until the voltage bleeds off through the 15 megohm resistor R-14. Then the receiver will again operate normally. NOTE: If the battery polarity is reversed the receiver will not mute and it may become distorted during the change cycle. Always connect the positive (+) terminal of the storage battery or power supply to the receiver case when checking the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all adjustments on the receiver with volume control turned full on and foot volume control cable plugged into its socket. Reduce signal intensity as much as possible at signal generator. Connect output meter across voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.

2. Set signal generator to 265 Kc.

3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)

4. Adjust I.F. trimmers A, B, C, and D (Fig. 10), in the order named for maximum output. Repeat the operation to assure accurate alignment.

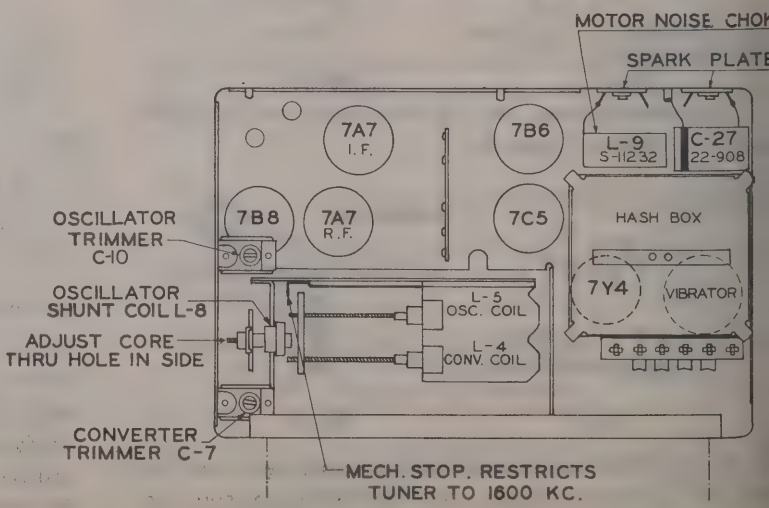


Fig. 11. Bottom View of Chassis.

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy illustrated in Fig. 12 to antenna lead in socket on receiver.

2. Set signal generator to 535 Kc.

3. Place set in manual tuning position and set dial to 535 Kc.

4. Adjust oscillator trimmer C-11 (Fig. 11), for maximum response.

5. Set signal generator to 1200 Kc.

6. Tune set to 1200 Kc.

7. Adjust converter trimmer C-7 (Fig. 11) and R.F. trimmer C-3 (Fig. 10) for maximum response.

8. If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

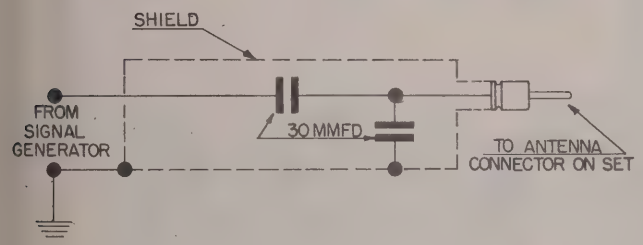


Fig. 12. Dummy Antenna

Fig. 12—Schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

1. Replace coil or core.

2. Set signal generator to 1700 Kc.

3. Connect signal generator leads through dummy illustrated in Figure 12 to antenna receptacle on the receiver.

4. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)

5. Screw the core completely out of the antenna coil, the R. F. Coil, the converter coil, and the oscillator coil.

6. Adjust oscillator trimmer C-10 (Fig. 11), at 1700 Kc.

7. Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 10 and 11) for maximum output reading.

8. Replace cores to their approximate original positions

9. Set generator dial and receiver dial to 1200 Kc.

10. Adjust oscillator core (Figure 10) to scale at 1200 Kc.

11. Adjust the antenna core, R.F. core, and converter core (Fig. 10 and 11), for maximum output reading.

12. Set signal generator to 600 Kc.

13. "Rock in" shunt oscillator coil (Fig. 11) for maximum output reading. (This should only be done as a last resort.) This is the same as rocking in the padder condenser on a ganged condenser receiver.

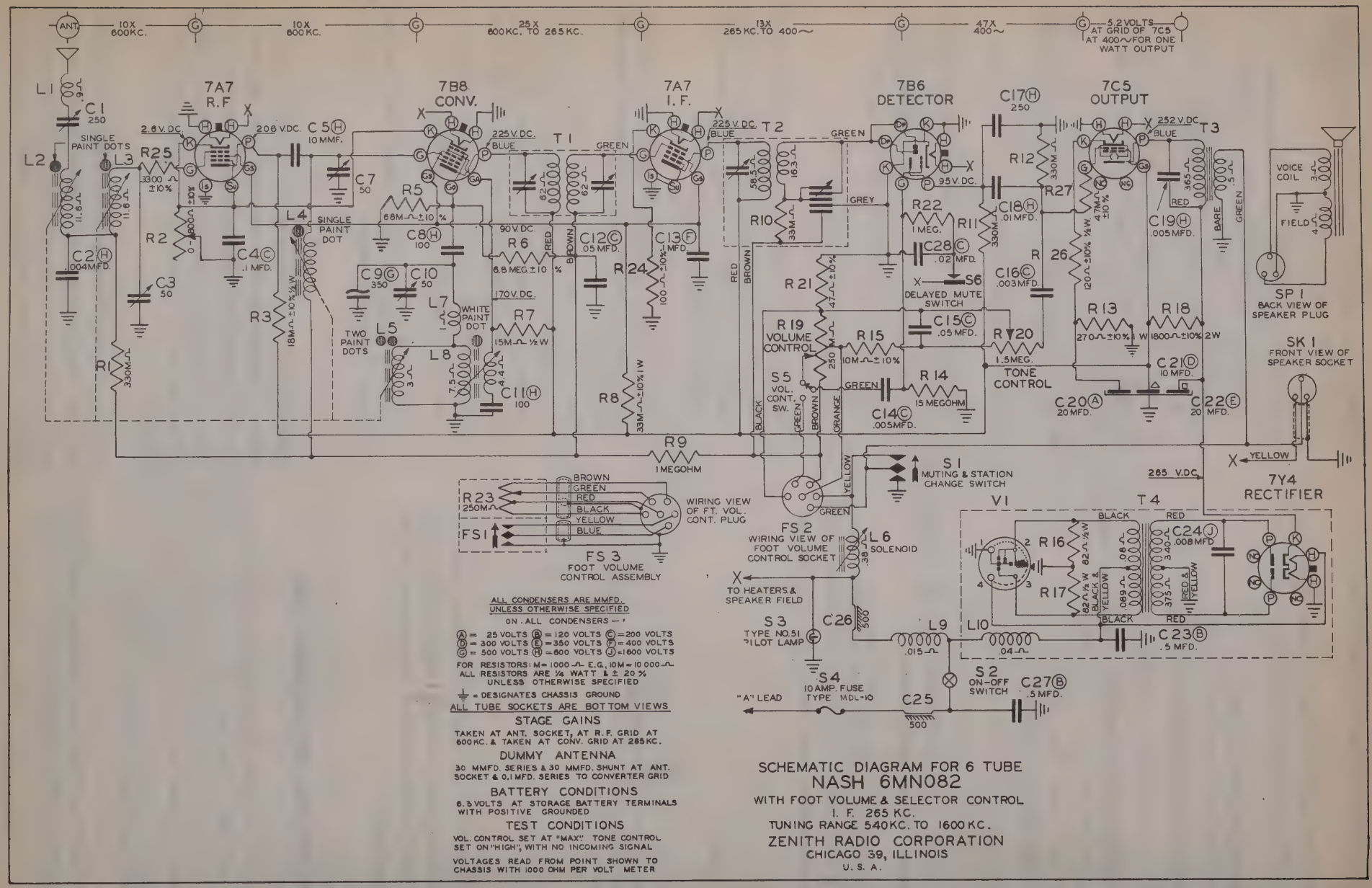
14. Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.

15. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc. the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

    After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc. Extend antenna to maximum before adjusting the antenna trimmer.

The approximate voltages are measured with a 1000 ohm per volt meter between the socket terminals and the chassis as shown on the circuit diagram. The Volume Control is set at maximum with no signal. Battery voltage is 6.3



ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED

ON ALL CONDENSERS —

(A) = 25 VOLTS (B) = 120 VOLTS (C) = 200 VOLTS
(D) = 300 VOLTS (E) = 350 VOLTS (F) = 400 VOLTS
(G) = 500 VOLTS (H) = 600 VOLTS (J) = 1600 VOLTS

FOR RESISTORS: M = 1000 Ω E.G. 10M = 10 000 Ω
ALL RESISTORS ARE ⅛ WATT & ± 20 % UNLESS OTHERWISE SPECIFIED

⏚ = DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANT. SOCKET, AT R.F. GRID AT 600 KC. & TAKEN AT CONV. GRID AT 265 KC.

DUMMY ANTENNA

30 MMFD. SERIES & 30 MMFD. SHUNT AT ANT. SOCKET & 0.1 MFD. SERIES TO CONVERTER GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOL. CONTROL SET AT "MAX." TONE CONTROL SET ON "HIGH"; WITH NO INCOMING SIGNAL

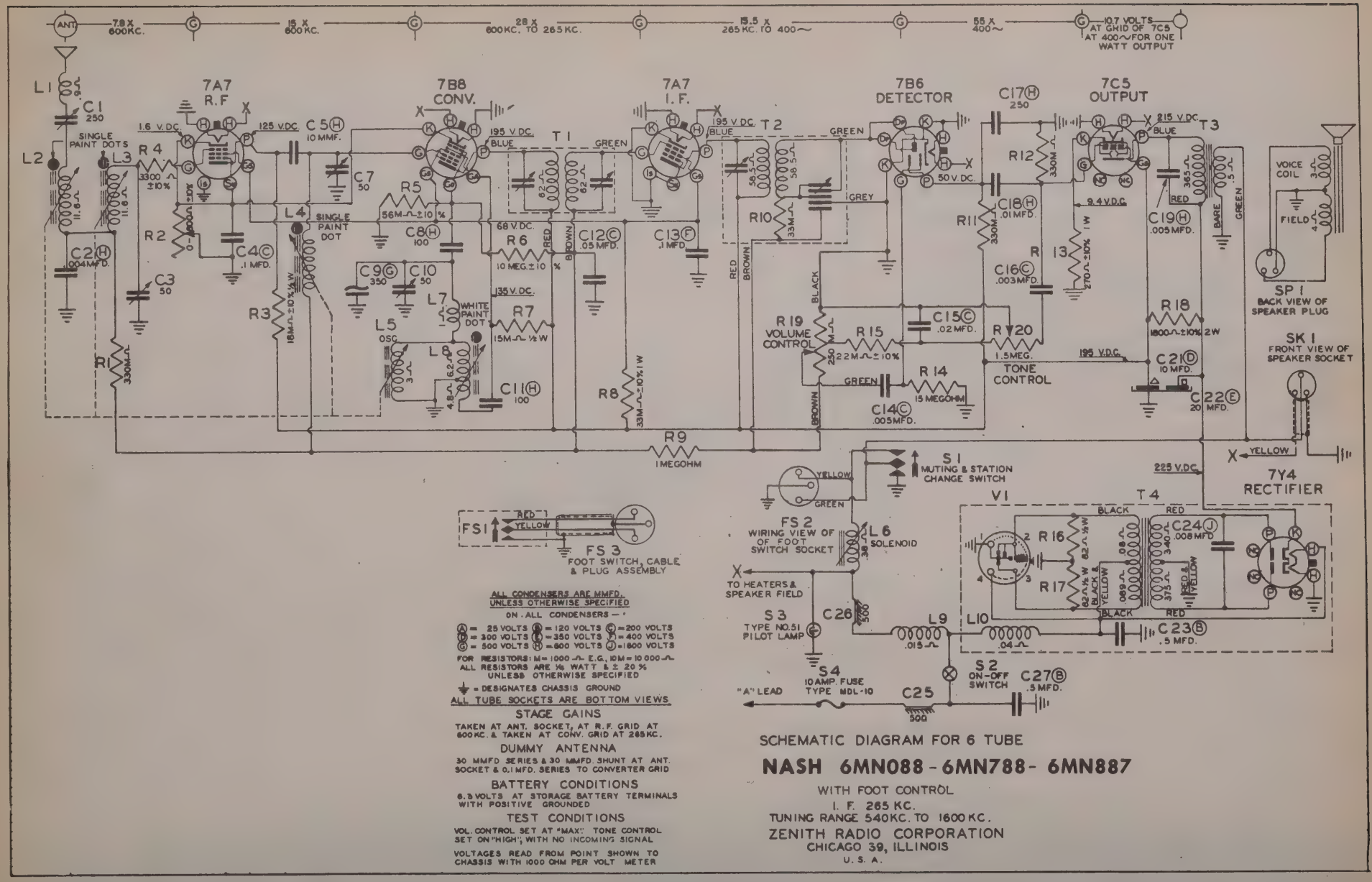
VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

SCHEMATIC DIAGRAM FOR 6 TUBE NASH 6MN082

WITH FOOT VOLUME & SELECTOR CONTROL
I. F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.

ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS
U. S. A.

Circuit Diagram



ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED

ON ALL CONDENSERS — '

(A) = 25 VOLTS (B) = 120 VOLTS (C) = 200 VOLTS
(D) = 300 VOLTS (E) = 350 VOLTS (F) = 400 VOLTS
(G) = 500 VOLTS (H) = 600 VOLTS (J) = 1600 VOLTS

FOR RESISTORS: M = 1000 Ω E.G. 10M = 10 000 Ω
ALL RESISTORS ARE ½ WATT & ± 20 % UNLESS OTHERWISE SPECIFIED

⏚ = DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANT. SOCKET, AT R.F. GRID AT 600 KC. & TAKEN AT CONV. GRID AT 265 KC.

DUMMY ANTENNA

30 MMFD SERIES & 30 MMFD. SHUNT AT ANT. SOCKET & 0.1 MFD. SERIES TO CONVERTER GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOL. CONTROL SET AT "MAX." TONE CONTROL SET ON "HIGH"; WITH NO INCOMING SIGNAL

VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

SCHEMATIC DIAGRAM FOR 6 TUBE

NASH 6MN088 - 6MN788 - 6MN887

WITH FOOT CONTROL

I. F. 265 KC.

TUNING RANGE 540 KC. TO 1600 KC.

ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS
U. S. A.

PARTS LIST MODEL 6MN082 (CHASSIS 6C82)

1946 NASH LONG DISTANCE RADIO AC-6016

COILS AND CHOKES

Diagram No.	Part No.	
L10	20-213	Main hash choke
T 1	95-916	1st I.F. transformer
T 2	95-917	2nd I.F. transformer
L 1	S8819	Antenna motor noise choke assem.
L 7	S11229	Oscillator series coil assem.
L 8	S11231	Oscillator shunt coil assem.
L 9	S11232	Motor noise choke coil assem.
L 2, L 3	S11040	Antenna & R.F. coil assem.
L 4, L 5	S11041	Osc. & conv. coil assem.

CONDENSERS

C 8, C11	22-162	100 mmfd. 600 volt
C13	22-170	.1 mfd. 400 volt
C17	22-182	250 mmfd. 600 volt
C 4	22-190	.1 mfd. 200 volt
C12	22-250	.05 mfd. 200 volt
C19	22-838	.005 mfd. 600 volt
C14	22-906	.005 mfd. 200 volt
C27, C23	22-908	.5 mfd. 120 volt
C18	22-1170	.01 mfd. 600 volt
C16	22-1180	.003 mfd. 200 volt
C 2	22-1244	.004 mfd. 600 volt
C28	22-1270	.02 mfd. 200 volt
C15	22-1374	.05 mfd. 200 volt
C 3	22-1376	R.F. trimmer
C 7	22-1377	Detector trimmer
C10	22-1378	Oscillator trimmer
C20, C21, C22	22-1387	20MFD. 25 W.V. Electrolytic 20 MFD. 350 W.V. Electrolytic 10 MFD. 300 W.V. Electrolytic
C 1	22-1420	Antenna trimmer
C24	22-1448	.008 mfd. 1600 volt
C 5	22-1456	10 mmfd. 600 volt mica
C 9	22-1478	350 mmfd. compensator

RESISTORS

R19, R20, S 5	63-1342	Tone control vol. control & sw.
R18	63-1368	1800 ohm 2 watt W.W.
R13	63-1369	270 ohm 1 watt W.W.
R 2	63-1379	800 ohm sensitivity control
R 8, R22	63-1390	1 megohm ¼ watt
R10	63-1391	33M ohm ¼ watt
R 1, R11, R12	63-1392	330M ohm ¼ watt
R21	63-1393	47 ohm ¼ watt
R15	63-1394	10M ohm ¼ watt
R 5	63-1396	68M ohm ¼ watt
R 8	63-1398	33M ohm 1 watt
R16, R17	63-1399	82 ohm ½ watt
R14	63-1400	15 megohm ¼ watt
R 7	63-1401	15M ohm ½ watt
R26	63-1410	120 ohm ½ watt
R 3	63-1411	18M ohm ½ watt
R24	63-1414	100 ohm ¼ watt
R 6	63-1416	6.8 megohm ¼ watt
R27	63-1417	47,000 ohm ¼ watt
R25	63-1418	3300 Ohm ¼ watt

MISCELLANEOUS

SK1	52-280	Speaker cable & socket
	52-311	Battery cable (set to fuse)
	52-312	Battery cable (fuse to ammeter)
	78-281	Vibrator socket
FS2	78-551	Foot switch cable plug socket
	78-596	Tube socket—Loktal base (8 contact)
	80-374	Knob spring—L.H.
	80-375	Knob spring—R.H.
S2	85-353	On-off switch
	93-456	Vibrator cushion washer
T4	95-914	Power transformer
T3	95-915	Output transformer
S4	136-12	Fuse—20 amp.
V1	190-20	Vibrator
	192-86	Dial crystal
	202-406	Instruction book
S1	S11270	Hand selector & muting switch assem.
	S11391	Antenna connector socket & bracket assem.
	S11392	Front housing & mtg. bushing assem.
	S11395	Escutcheon dial crystal & key plate assem.
FS3	S12348	Foot switch, vol. control, cable & plug assem.
	63-1287	Foot vol. control
	S11922	Foot switch rubber cap assembly

SPEAKER AND SPEAKER MOUNTING PARTS

SP1	49-500	8" dynamic speaker & plug
	54-30	No. 8/32 x 5/16 x 7/64 Hex nut
	57-862	Speaker mounting plate
	112-298	No. 8/32 x ½ B.H. M.S.
	147-102	Speaker mounting spacer
	196-38	Speaker gasket

DIAL AND TUNING MECHANISM ASSEMBLY

Diagram No.	Part No.	
S3	100-32	Dial light bulb
L6	S10829	Solenoid & terminal assem.
	26-333	Dial scale (manual tuning)
	34-132	Indexing disc
	34-143	Idler gear
	34-154	Ratchet gear
	34-135	Volume control gear
	57-1046	Key plate (4 used)
	59-154	Dial pointer
	59-168	On-off indicator
	80-329	Gear indexing spring
	80-331	Cross arm return spring
	80-332	Cam lever spring
	80-336	Ratchet gear return spring
	80-340	Lever spring
	80-341	Kick-off spring
	80-342	Tuning shaft spring
	80-343	Solenoid switch spring
	80-344	Solenoid switch contact spring
	149-44	Adjusting spring & core
	188-45	Turret screw lock ring
	S10826	Solenoid end (plug & bracket assem.)
	S10831	Ratchet & bracket assem.
	S10834	Mounting plate & lever asssem.
	S10836	Cross arm assem.
	S11053	Tuning shaft & gear assem.
	S11082	Turret assem.
	S11179	Dial drum & bracket assem.
	S11627	Dial light socket & wire assem.

MOTOR NOISE SUPPRESSION KIT

Part No.	
S11399	Motor noise suppression kit complete
22-919	Ammeter & fuel gauge condenser
22-920	Generator condenser
22-1322	Temperature gauge condenser
22-1526	Ignition coil condenser
22-1555	Oil gauge condenser
63-1046	Distributor suppressor
80-145	Motor hood bond spring

KNOBS AND INSTALLATION PARTS

S11400	Set installation kit complete
S11394	Tuning knob trim knob & set screw (46-536 & 537)
46-485	Volume control knob
46-534	Tone control knob
54-146	No. 10/32 wing nut
54-148	¼-20 x ½ x ¼ Hex nut
54-153	7/16-28 x .120 hex. nut
80-232	Knob retaining spring
93-127	No. 10 internal shakeproof lockwasher
93-173	¼ internal shakeproof lockwasher
93-416	1/32 x 13/64 x 5/8 steel washer
112-310	Foot switch mounting screw
144-20	Set mounting bolt
147-101	Set mounting spacer
188-41	Spacer ring

PARTS LIST MODEL 6MN088 (CHASSIS 6C88)

The parts list for Model 6MN088 is the same as for Model 6MN082 with the following parts omitted and added.

ADD			OMIT	
Diagram No.	Part No.	Description	Part No.	Description
FS3	S-13246	Foot Switch Assembly	S-12348	Foot Control and Switch Assembly
T2	95-942	I.F. Transformer	95-917	I.F. Transformer
FS2	78-646	Foot Switch Socket	78-551	Foot Switch Socket

PARTS LIST MODEL 6MN788 (CHASSIS 6D88)

The parts listed for Model 6MN788 is the same as for Model 6MN082 with the following parts omitted and added.

ADD			OMIT	
Diagram No.	Part No.	Description	Part No.	Description
C20, C21, C22	22-1644	Electrolytic Condenser	22-1387	Electrolytic Condenser
FS3	S-13246	Foot Switch Assembly	S-12348	Foot Control and Switch Assembly
	S-13398	Escutcheon Dial Crystal and Key Plate Assembly	S-11395	Escutcheon Dial Crystal and Key Plate Assembly
	S-13443.	Tuning Knob and Set Screw Assembly	S-11394	Tuning Knob and Set Screw Assembly
	46-642	Volume Control Knob	46-485	Volume Control Knob
T3	95-1026 / 95-1024	Output Transformer	95-915	Output Transformer
T4	95-1023	Power Transformer		
	S-13444	Installation Kit Assembly	S-11400	Installation Kit Assembly

PARTS LIST MODEL 6MN887 (CHASSIS 6D87)

The parts listed for Model 6MN887 is the same as Model 6MN788 with the following parts omitted and added.

ADD			OMIT	
Diagram No.	Part No.	Description	Part No.	Description
	S-11394	Tuning Knob and Set Screw Assembly	S-13443	Tuning Knob and Set Screw Assembly
	46-485	Volume Control Knob	46-642	Volume Control Knob

PRINTED IN U. S. A.

SERVICE MANUAL

Built for
NASH MOTORS
Division of
Nash-Kelvinator Corp.,
Kenosha, Wis.

ZENITH
REG U S PAT OFF
LONG DISTANCE AUTO RADIO
REG U S PAT OFF

For Model
6MN988
(Nash Part No.
A.C.-149-1)

ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY.....4 microvolts at one watt output.

POWER OUTPUT:.....5.0 watts measured at the voice coil.

SPEAKERS:.....6″ round front speaker
6″ x 9″ oval, rear speaker

CURRENT CONSUMPTION:.....6.5 amperes

INSTANTANEOUS CURRENT CONSUMPTION DURING AUTOMATIC CHANGE CYCLE.....20 amperes

TUBE COMPLEMENT:.....7A7 R.F., 7B8 converter, 7A7 I.F., 7B6 detector and 1st audio, 7C5 power output, 7Y4 rectifier.

IMPORTANT

The warranty tag must be filled in by the car dealer at time of sale and accompany each receiver to be serviced at established warranty rates during the guarantee period. Otherwise regular charges for labor and material prevail. All repairs, whether in or out of warranty, are for the account of the car dealer or customer. DO NOT send claims to the Zenith Radio Corporation.

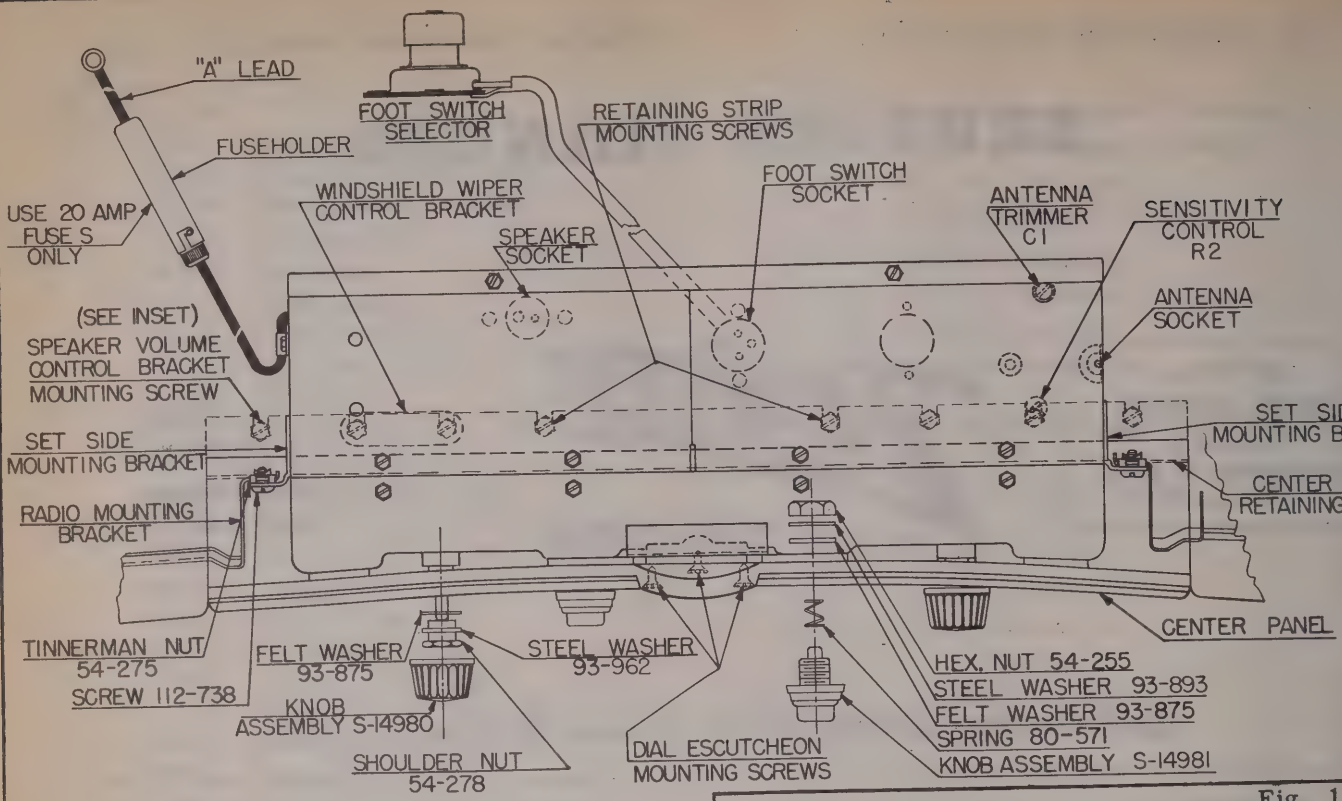
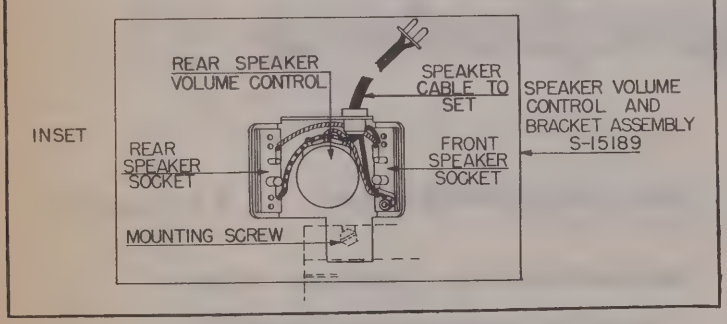


Fig. 1



RECEIVER INSTALLATION

Figures 1 and 4, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary.

To take the receiver from the car, disconnect the rear speaker control bracket, the 'A' lead, speaker cable, antenna cable, and foot switch control cable. Remov the control knobs and mounting nuts, and washers fro the center panel. Loosen the 8/32 hex-head retainin strip mounting screws and remove the center panel. Re move the four #112-738 10/32 machine screws from th car radio mounting brackets. (Fig. 1)

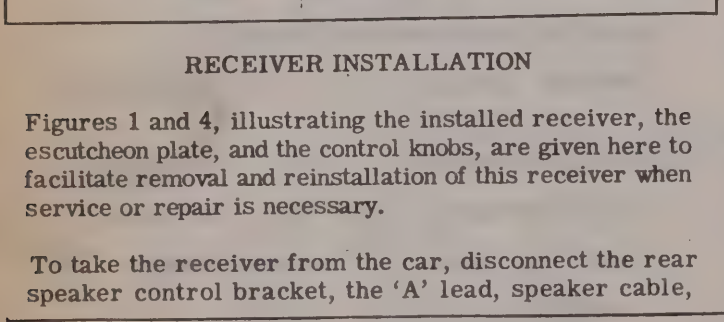


Fig. 2

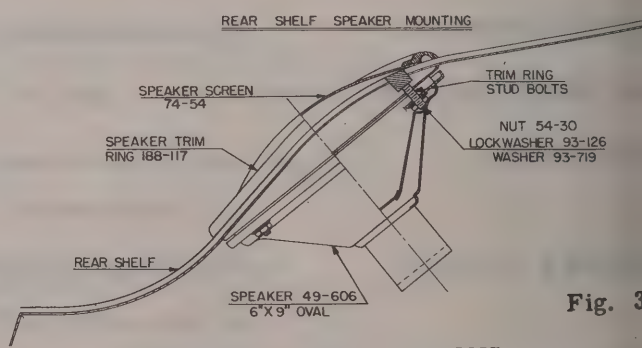


Fig. 3

SPEAKER INSTALLATIONS

To take out front speaker, remove the right side kick pa and remove the four lock washers #93-126, four nu #54-30, four screws #112-739, and trim ring #188-11 that holds the speaker to the kick pad. Figure 2.

To take out the rear speaker, remove the four f washers #93-719, four lock-washers #93-126, and fo hex-nuts #54-30, that holds the speaker to the undersi of the rear shelf. Figure 3.

OPERATION

The purpose and position of each control is shown Fig. 3. To turn the receiver on, turn the volume cont knob to the right until it clicks and the dial is illuminat Rotation of the knob to the right increases the volun To turn the receiver off, turn the volume control knob the left until it clicks.

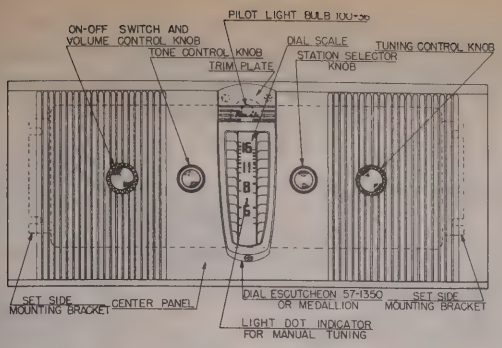


Fig. 4

MANUAL TUNING

To tune set manually, push the station selector knob until the light dot on the dial scale is illuminated. It is only necessary for the manual tuning knob to be turned to select stations.

TONE CONTROL

The tone control has four positions. Any one of these positions can be selected by pushing the tone control knob.

MUTING CIRCUIT

Lightly pressing either the station selector knob or the foot control switch mutes the receiver. This action is accomplished by shorting out the speaker voice coil.

REPLACEMENT OF DIAL LIGHT

NOTE: The top dial light can be replaced while the set is installed in the car by removing the escutcheon trim plate.

When replacing this light, be careful to adjust the black cardboard shield to a position where the slot directs the light on the dial pointer and not on the scale background. (Fig. 4)

AUTOMATIC TUNING

Pressing the station selector knob repeatedly will cause the tuning mechanism to change through a cycle of six positions. The five automatic positions may be set for favorite local stations, while the sixth position at which the light dot on the dial scale is illuminated, may be used for selecting stations manually.

Using the manual tuning position as a reference point, the remaining five positions may be adjusted in succession to any desired dial setting. However in order to simplify the identification of the stations, it is advisable to set the tuner in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

Turn the receiver on and allow it to operate for at least 15 minutes in order for each part to reach normal operating temperature before making the proper setting.

1. Press the station selector knob repeatedly until the light dot on the dial scale appears. Press the station selector knob once more to get the tuner to the No. 1 position.

2. To select the station desired, pull the tuning control knob outward and turn at the same time. Tune very carefully for clearest reception.

3. Press station selector knob, pull and hold tuning control knob outward, and tune in station desired for No. 2 position. Use same proceedure for positions No. 3, 4, and 5.

INTERFERENCE ELIMINATION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The "A" lead should be connected to the terminal block near the steering column behind instrument panel as shown in figure 5.

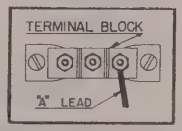


FIG. 5

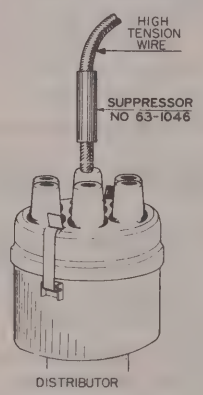


FIG. 6

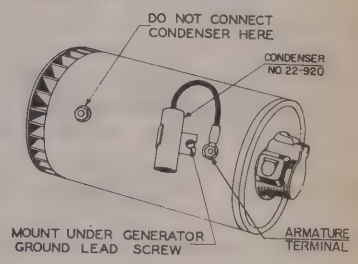


FIG. 7

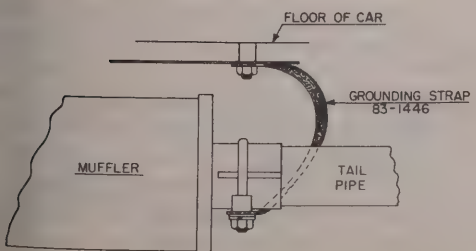


FIG. 10

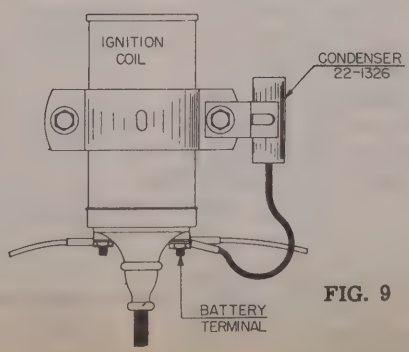


FIG. 9

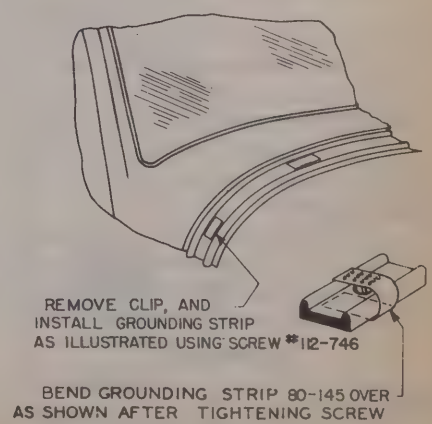

REMOVE CLIP, AND INSTALL GROUNDING STRIP AS ILLUSTRATED USING SCREW #12-746
BEND GROUNDING STRIP 80-145 OVER AS SHOWN AFTER TIGHTENING SCREW

FIG. 8

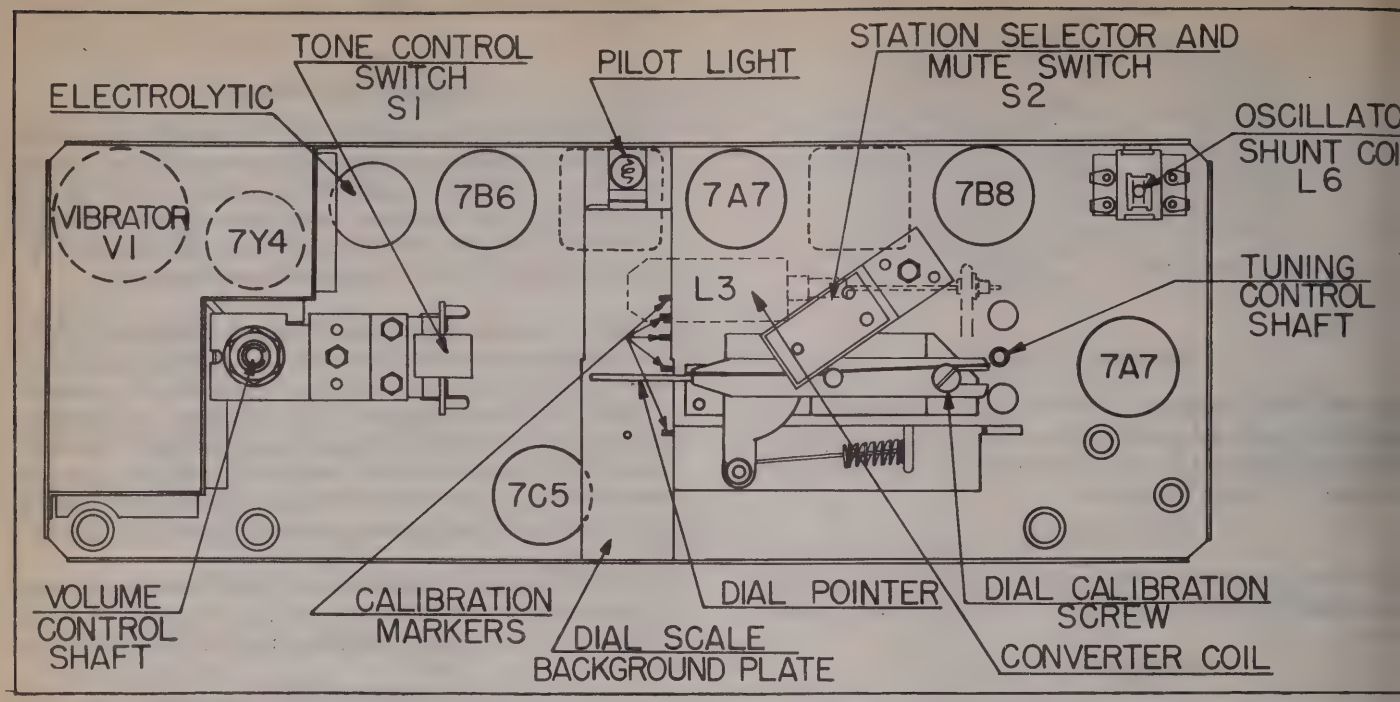


Fig. 11 Front View of Chassis

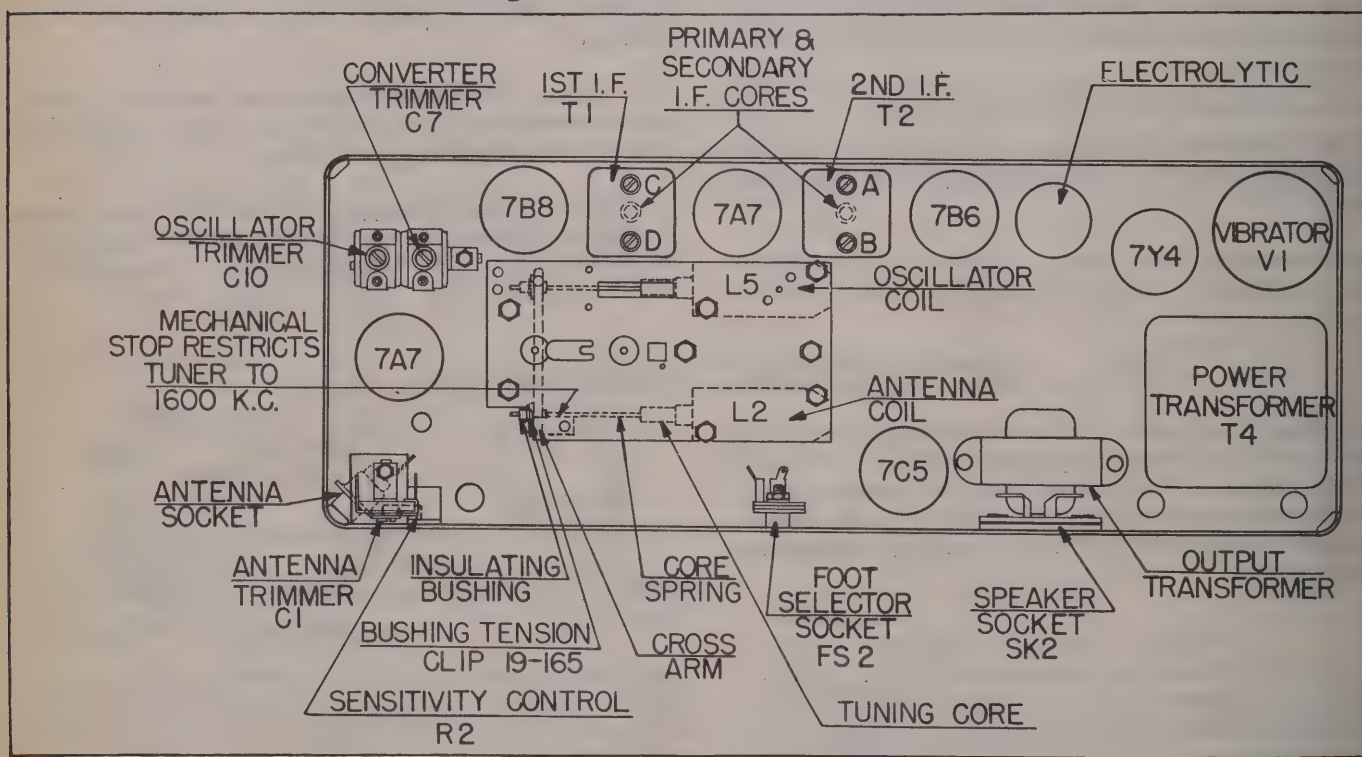


Fig. 12 Rear View of Chassis

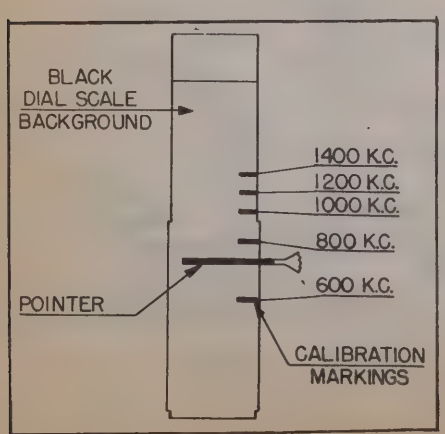


Fig. 13

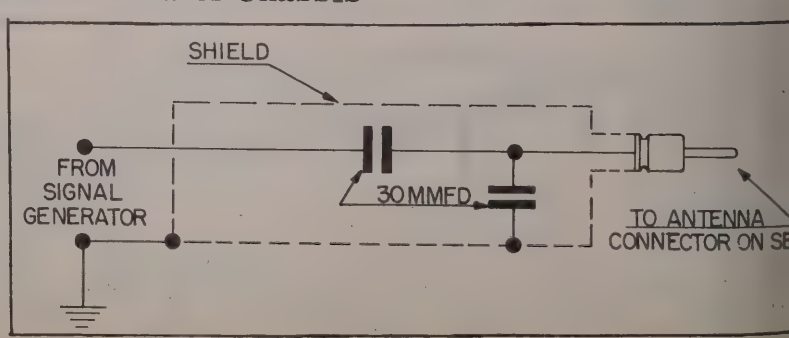


Fig. 14

ure 14 shows the schematic of a recommended dummy enna, closely resembling actual antenna capacity, to used in series with signal generator leads when align- the R. F. section of the receiver.

ALIGNMENT

dimum performance depends on accurate alignment of receiver, therefore follow these instructions care- y.

UTION: Make all alignment adjustments to the re- ver with the volume control set at maximum. Reduce signal intensity as much as possible at the signal erator. Connect the output meter across the voice

I.F. ALIGNMENT PROCEDURE

Remove front and rear covers from receiver.
Set signal generator to 265 Kc.
Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket)
Adjust I.F. trimmers, A, B, C, and D in order named for maximum output. (Fig. 12) Some units have I.F. transformers that are core tuned. In this case adjust primary and secondary I.F. cores from the top of the I.F. cans with core alignment tool 68-7. Repeat the operation to assure accurate alignment.

R.F. AND OSCILLATOR ALIGNMENT

the markings on the dial scale background as bration points during alignment. Figure 13

Connect signal generator leads through dummy, illus- rated in Fig. 14, to antenna lead in socket on re- eiver. This is important.
et signal generator to 600 Kc.
une set to 600 Kc.
djust oscillator trimmer C-10 (Fig. 12), for maxi- num response.
et signal generator to 1400 Kc.
une set to 1400 Kc.
djust converter trimmer C-7, and antenna trimmer -1 (Fig. 12) for maximum response.
dial calibration is off after making above adjust- ents, a correction can be made by tuning eccentric crew at fulcrum of dial pointer. (Fig. 11)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

emove the top cover from the receiver.
emove 7A7 R.F. tube, 7B8 converter tube, and 7A7 F. tube.
hen bushing tension clips 19-165 are used, remove em from the cross arm insulating bushing with bent se pliers. (Fig. 12)
ut automatic tuner in manual position and set the ner carriage all the way out to the high frequency sition or with the cores out of the coils.
ith core alignment tool, No. S-13064, screw the tenna core back all the way, at the same time using e fingers to guide it out of the automatic unit. With e fingers, remove core by turning core spring past d through the cross arm insulating bushing.

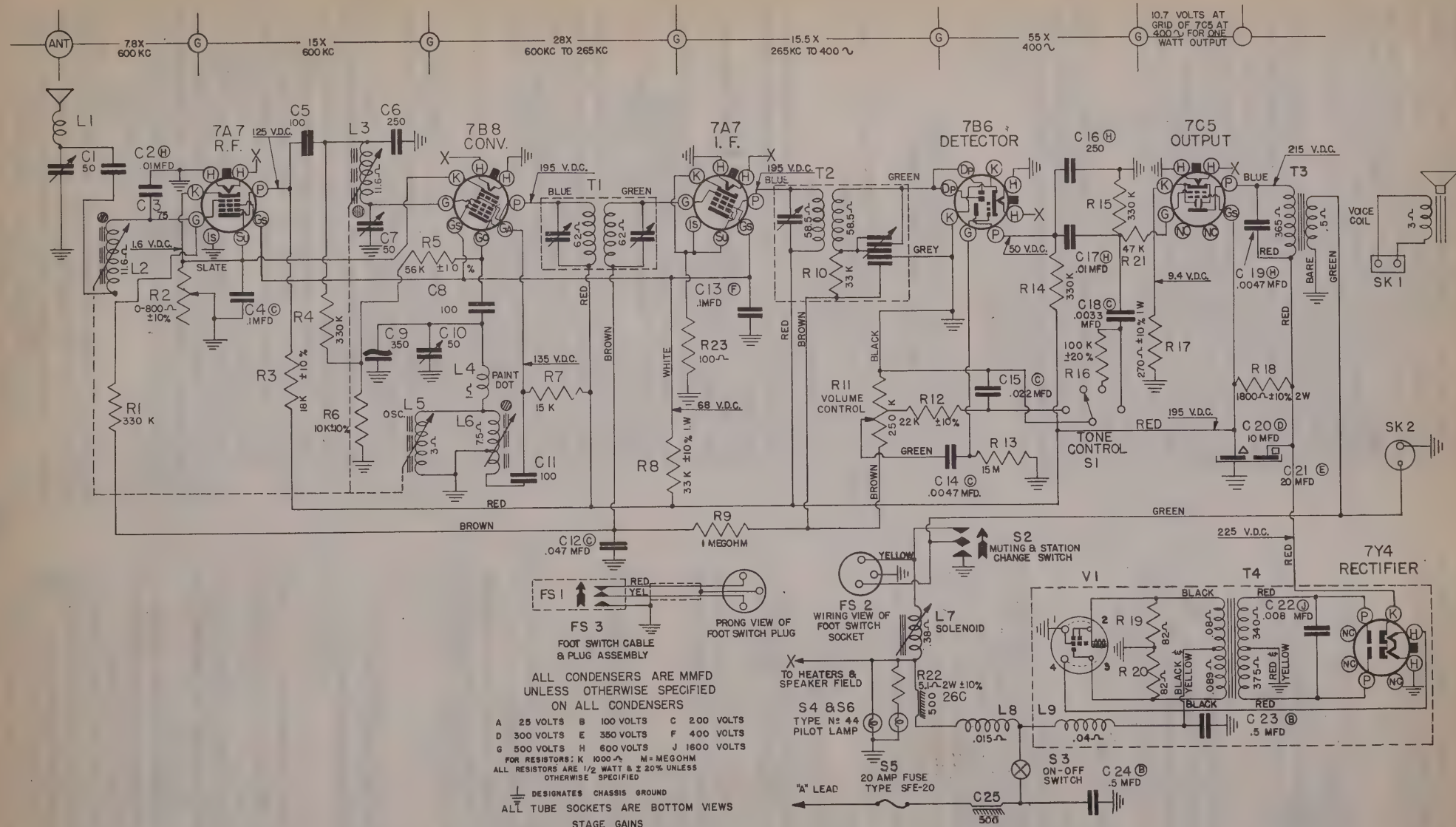
6. Screw the converter and oscillator cores completely out of the coils. Set antenna tuner carriage to half way position. Screw the converter and oscillator cores back all the way, at the same time using the fingers to guide them between the I.F. cans and out of the tuner unit. With the fingers, remove the cores by turning them past and through the cross arm insulating bushing.
7. To replace cores, set tuner carriage at half way position. With the fingers, guide the oscillator and converter cores between the I.F. coils and screw the core springs through the cross arm insulating bushing. Set tuner carriage to high frequency position and also using the fingers, screw the antenna core spring through the cross arm insulating bushing. Use core alignment tool No. S 13064 for further adjustments.
8. Replace tubes and top cover.
9. After all adjustments or replacements are completed, be sure to replace the bushing tension clip. When bushing clips are not used, glue core springs with speaker cement.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT.

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 14 to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (Fig. 12) at 1675 Kc.
6. Adjust the converter trimmer C-7, and antenna trimmer C-1 (Fig. 12) for maximum output reading.
7. Set signal generator dial and receiver dial to 1400 Kc.
8. Replace cores to their approximate original position (so that the cores project about 11/16 of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (Fig. 12) a scale at 1400 Kc.
10. Adjust the antenna core L-2, and converter core L-3 (Figs. 11 and 12) for maximum output reading.
11. Set signal generator at 600 Kc.
12. "Rock in" shunt oscillator coil L-6 (Fig. 11) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1400 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop should be bent to limit the frequency coverage to 1605 Kc. (Fig. 12)

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1400 Kc.



ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED ON ALL CONDENSERS

A	25 VOLTS	B	100 VOLTS	C	200 VOLTS
D	300 VOLTS	E	350 VOLTS	F	400 VOLTS
G	500 VOLTS	H	600 VOLTS	J	1600 VOLTS

FOR RESISTORS: K 1000 ~ M= MEGOHM

ALL RESISTORS ARE 1/2 WATT & ± 20% UNLESS OTHERWISE SPECIFIED

⏚ DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANT. SOCKET AT R.F. GRID AT 600 KC & TAKEN AT CONV. GRID AT 265 KC.

DUMMY ANTENNA

30 MMFD. SERIES & 30 MMFD. SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID.

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL.

VOLTAGES TO READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

SCHEMATIC DIAGRAM FOR 6 TUBE NASH 6MN988 WITH FOOT CONTROL

I.F. 265 KC.

TUNING RANGE 540KC. TO 1600 KC.

ZENITH RADIO CORPORATION

U. S. A.

SCHEMATIC

PARTS LIST MODEL 6MN988 NASH PART No. A. C. 149-1

Diag. No.	Part No.	Description	Price
		COILS & CHOKES	
L9	20-213	Main Hash Choke Coil	$ .36
T1	95-1056	1st I.F. Transformer	1.80
T2	95-1057	2nd I.F. Transformer	2.10
L1	S-8819	Ant. Motor Noise Choke Assem.	.40
L4	S-11229	Osc. Series Coil Assy.	.35
L5	S-12053	Osc. Coil Assy.	.84
L2	S-12060	R.F. Coil Assy. (2 used)	.96
L6	S-13998	Osc. Shunt Coil Assy.	1.10
L8	S-13999	Motor Noise Choke Assy.	.35
L2	S-14176	R.F. Coil & Shield Assy.	1.25
L3, L5	S-14177	Osc. & Converter Coil & Shield Assem.	2.10
		CONDENSERS	
C16	22-182	250 MMFD 600 V.	.26
C6	22-1136	250 MMFD 600 V.	.20
C3	22-1256	75 MMFD 500 V.	.20
C22	22-1448	.008 MFD 1600 V.	1.00
C9	22-1478	350 MMFD Compensator	.53
C21	22-1644	Dry Electrolytic 10 MFD. 300 V. X 20 MFD. 350 V.	1.60
C10, C7	22-1680	Trimmer (Osc. & Conv.)	.60
C1	22-1704	Ant. Trimmer	.35
C23, C24	22-1728	.5 MFD 100 V.	.55
C5, C8, C11	22-1730	100 MMFD. Ceramicon 500 V. (or 22-162)	.20
C13	22-1748	.1 MFD. 400 V. (or 22-170)	.26
C14	22-1777	.1 MFD. 200 V. (or 22-190)	.26
C12	22-1778	.047 MFD. 200 V. (or 22-250)	.26
C2	22-1779	.01 MFD. 600 V. (or 22-1170)	.26
C18	22-1780	.0033 MFD. 400 V. (or 22-1180)	.26
C15	22-1781	.022 MFD. 200 V. (or 22-1270)	.26
C19	22-1782	.0047 MFD. 600 V. (or 22-838)	.26
C14	22-1783	.0047 MFD. 400 V. (or 22-906)	.20
		RESISTORS	
R22	63-1375	5.1 ohm W.W. 2 W. Insl. (10%)	.33
R2	63-1379	Sensitivity Control	.56
R8	63-1398	33 M ohm 1 W. Insl.	.24
R11	63-1586	Volume Control & Switch	1.81
R18	63-1620	1800 ohm 2 W. Insl.	.36
R17	63-1621	270 ohm 1 W. Insl.	.24
	63-1683	Vol. Control (Rear Spkr.)	1.20
R19, R20	63-1740	82 ohm 1/2 W. Insl.	.21
R23	63-1744	100 ohm 1/2 W. Insl.	.21
R6	63-1827	10M ohm 1/2 W. Insl. (10%)	.21
R7	63-1835	15M ohm 1/2 W. Insl.	.21
R3	63-1838	18M ohm 1/2 W. Insl.	.21
R12	63-1841	22M ohm 1/2 W. Insl. (10%)	.21
R10	63-1849	33M ohm 1/2 W. Insl.	.21
R21	63-1856	47M ohm 1/2 W. Insl.	.21
R5	63-1859	56M ohm 1/2 W. Insl.	.21
R16	63-1870	100M ohm 1/2 W. Insl.	.21
R1, R4, R14, R15	63-1891	330M ohm 1/2 W. Insl.	.21
R9	63-1912	1 Megohm 1/2 W. Insl.	.21
R13	63-1961	15 Megohm 1/2 W. Insl.	.21

Diag. No.	Part No.	Description	Price
		MISCELLANEOUS	
	19-87	Cable Retaining Clip	$ .01
	19-165	Bushing Tension Clip	.03
	46-485	Rear Spkr. Vol. Cont. Knob	.19
	49-606	6"x 9" P.M. Speaker	7.75
	49-650	6" P.M. Speaker	7.00
	52-486	Bat. Cable (Set to Fuse)	.30
	52-510	Rear Spkr. Cable & Plug	
	52-511	Rear Spkr. Cont. Cable & Plug	.30
	54-34	#6-32 X 1/4 X 3/32 Hex Nut	.01
	57-1054	Spark Plate Capacitor	.10
	73-36	8-32 X 3/8 Headless Set Screw	.02
	74-53	Speaker Screen	.50
	74-54	Rear Speaker Screen	.90
FS2	78-406	Ft. Sw. Cable Plug Socket	.12
	78-559	Ant. Connector Socket	.18
	78-596	Loktal Base Tube Socket	.18
	78-804	Vibrator Socket	.20
SK2	78-833	Speaker Plug Socket	.15
	80-232	Knob Retaining Spring	.02
	80-276	Socket Ground Spring	.07
	80-585	Pointer Overthrow Spring	.02
	83-1437	Top Cover Spacer Strip	.05
S1	85-414	Tone Control Switch	1.25
S2	85-415	Selector Switch	.75
	93-125	6 Int. Lockwasher	.01
	93-297	1/32 X .136 X 3/8 Steel Washer	.01
	93-456	Vibrator Cushion Washer	.02
	93-686	Bakelite Shoulder Washer	.02
T3	95-1028	Output Transformer	2.65
T4	95-1065	Power Transformer	7.25
	110-135	Grille Cloth	.10
	114-49	6-32 X 5/8 Acorn Hd. M.S.	.01
	114-297	6-32 X 1/4 Hex.Hd.Slotted S.T. Screw (Used on 19-87)	.01
	125-58	Strain Relief Grommet	.15
	125-59	Strain Relief Grommet	.15
	147-102	Socket Mtg. Spacer	.03
	159-50	Plug Button	.01
	188-30	Drive Arm Retaining Ring	.02
	188-115	Speaker Trim Ring	1.00
	188-117	Speaker Trim Ring	2.75
V1	190-20	Vibrator	4.15
	193-31	Footswitch Template	.10
	196-102	Rubber Gasket for Top Cover	.30
	196-103	Felt Gasket for Top Cover	.30
	202-556	Instruction Book(Owners Manual)	.15
	S-13536	Turret Assem.	2.65
	S-13926	Top Cover Assem.	2.15
	S-14144	Vol. Con. Brkt. & Lug Assy.	.05
	S-14157	Vol. Con. Cable Assy.	.06
	S-14158	Sensitivity Con., Capacitor, Socket & Choke Assem.	2.00
	S-14166	Bottom Cover Assy.	.65
FS3	S-14607	Footswitch Assem.	3.00
	S-15189	Rear Spkr. Vol. Con. Assy.	3.00

INSTALLATION KIT

S-14162	Installation Kit Assy (Comp.)	1.00
52-485	Battery Cable (Fuse to Ammeter)	.50
54-30	8-32 X 5/16 X 7/64 Hex. Nut	.01
54-278	3/8 - 32 X 9/16 Hex Shoulder Nut (2 used)	.05

Diag. No.	Part No.	Description	Price
		INSTALLATION KIT (continued)	
	69-260	12-24 X 1/2 R.H.M.S. Steel	$ .01
	93-126	8 Int. Lockwasher	.01
	93-719	.031 X 3/16 X 7/16 Steel Washer (8 used)	.01
	93-875	.065 X 17/32 X 25/32 Felt Washer	.02
	93-916	12 Split Lockwasher	.01
	93-917	1/32 X .234 X 9/16 Steel Washer	.01
	93-962	.020 X 33/64 X 3/4 Steel Washer	.02
	112-310	10 X 1/2 R.H.S.M. Screw	.02
	112-739	8-32 X 3/4 Countersunk Oval Hd. M.S. (4 used)	.03
S5	136-12	20 Amp. Fuse	.12
		MOTOR NOISE SUPPRESSION KIT	
	S-14822	Motor Noise Suppression Kit (Complete)	1.80
	22-920	.5 MFD. Generator Cond.	.45
	22-1326	.5 MFD. Ignition Coil Cond.	.58
	63-1046	Distributor Suppressor	.31
	80-145	Motor Hood Bond Spring	.02
	83-1446	Bonding Strip	.20
		KNOB KIT	
	S-14982	Knob Kit Assy. (Complete)	3.00
	S-14980	Tuning & Vol. Cont. Knob	.70
	S-14981	Tone Cont. & Sel. Switch Knob	.55
	54-255	Switch Plunger Nut	.15
	80-571	Switch Plunger Spring	.01
	93-975	.065X17/32 X 25/32 Felt Washer	.02
	93-893	3/64 X .504 X 7/8 Steel Washer	.02
		PUSH-PULL TUNER PARTS	
	12-1489	Guide Rod Brkt.	.20
	34-132	Indexing Disc.	.02
	34-158	Ratchet Gear	.34
	34-178	Tuning Gear	.20
	56-127	1/16 X 3/8 Groove Pin	.02
	57-1077	Protector Plate	.02
	57-1327	Front Mtg. Plate	.10
	76-378	Guide Rod (2 used)	.10
	80-329	Gear Indexing Spring	.03
	80-331	Cross Arm Return Spring	.06
	80-332	Cam Lever Spring	.03
	80-336	Ratchet Gear Return Spring	.01
	80-341	Kick-off Spring	.01
	80-552	Tuning Shaft Spring	.02
	93-631	Retaining Washer	.01
	94-438	Cylindrical Spacing Bushing	.12

Diag. No.	Part No.	Description	Price
	S-14177	Osc. & Converter Coil & Shield Assy.	2.10
	S-14178	Push-Pull Tuner Assem. (Complete)	
		DIAL & TUNING MECHANISM	
		Dial Scale furnished by Nash Motors	
	57-1329	Dial Scale Background Plate	$ .15
	57-1350	Dial Trim Plate (Escutcheon)	1.00
	78-818	Dial Light Socket Shell	.03
	80-141	Dial Light Socket Spring	.01
	80-583	Indicator Spring	.05
	80-659	Light Shield Retaining Spring	.04
	80-688	Pointer Retaining Spring	.04
S4 S6	100-36	Dial Light Bulb-Mazda #44 (2 used)	.09
	118-39	Pointer Drive Link	.02
	126-585	Manual Indicator Light Shield	.01
	126-586	Dial Light Shield	.04
	148-86	Pointer Drive Arm	.05
	S-13528	Tuning Shaft & Gear Assem.	.45
	S-13918	Pointer & Arm Assem.	.10
	S-13922	Indicator Flag Assem.	.30
	S-14156	Dial Light Socket & Dial Plate Assem.	.25
	S-14825	Dial Light Wire & Bushing Assy.	.10
	S-14949	Dial Light Wire & Bushing Assy.	.10
	S-15239	Pointer Drive Arm & Stud Assy.	.10
	S-15241	Pointer Bracket & Stud Assy.	.10
	94-601	Iron Core Insulating Bushing	.13
	112-725	Automatic Turret Screw	.30
	128-39	Indicator Cam	.03
	147-126	Gear & Disc. Spacer	.04
	149-70	Adjusting Spring & Core	.53
	188-108	Retaining Spring	.02
	197-20	Spring Retaining Cup	.02
	S-10826	Solenoid End Plug & Brkt. Assy.	.30
	S-10829	Solenoid & Terminal Assy.	.79
	S-13528	Tuning Shaft & Gear Assy.	.45
	S-13536	Turret Assy.	2.65
	S-13996	Ratchet & Brkt. Assy.	.65
	S-14174	Mtg. Plate & Retaining Strip Assy.	.30
	S-14175	Cross Arm Assem.	1.00
	S-14176	R.F. Coil & Shield Assy.	1.25

Prices subject to change without notice.

5M C.P. 10-48
Printed in U.S.A.

SERVICE MANUAL

Built for
WILLYS OVERLAND
Motors, Inc.
Toledo, Ohio

ZENITH
LONG DISTANCE AUTO RADIO

For Model
6MW083

Made by ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....4 microvolts at one watt output.

POWER OUTPUT:.....5.5 watts measured at the voice coil.

SPEAKER:.....8″ round, mounted on firewall.

CURRENT CONSUMPTION:.....7.5 amperes

INSTANTANEOUS CURRENT CONSUMPTION DURING AUTOMATIC CHANGE CYCLE:.....20 amperes

TUBE COMPLEMENT:.....7A7 R.F., 7B8 converter, 7A7 I.F., 7B6 detector and 1st audio, 7C5 power output, 7Y4 rectifier.

IMPORTANT

The warranty tag must be filled in by the car dealer at time of sale and accompany each receiver to be serviced at established warranty rates during the guarantee period. Otherwise regular charges for labor and material prevail. All repairs, whether in or out of warranty, are for the account of the car dealer or customer. DO NOT send claims to the Zenith Radio Corporation.

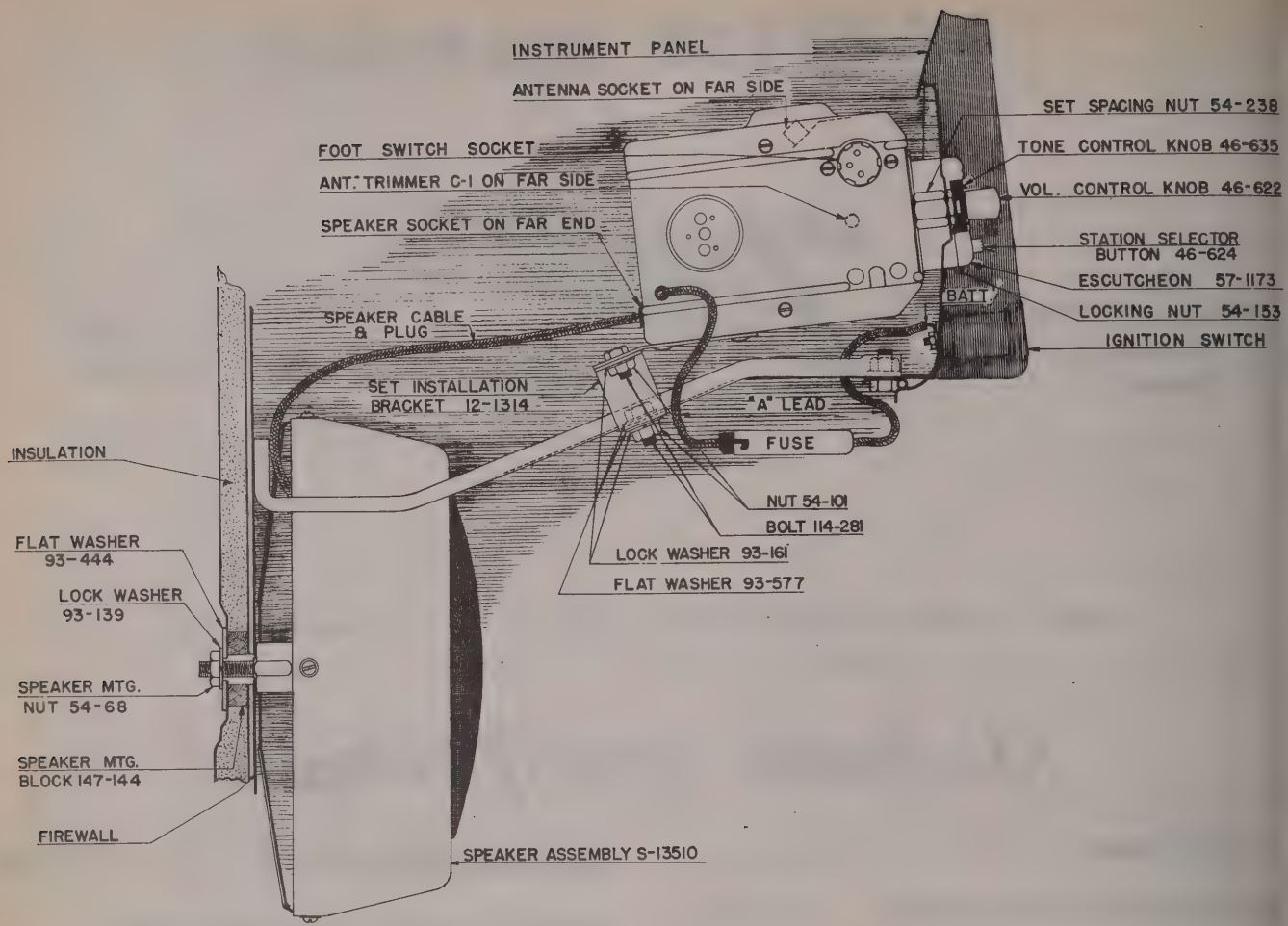


Fig. 1. Installation

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary.

To take the receiver from the car, remove the control knobs and mounting nuts from the front panel, and remove the set installation Bracket No. 12-1314 from the rear set mounting bracket.

MANUAL TUNING

1. Press the Station Selector push button (Fig. 2) several times or until the green dot in the dial scale is illuminated.
2. Pull the Manual Tuning control knob (right hand) outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust the left hand control knob for desired volume.

TONE CONTROL—The tone control is located behind the volume control knob. Turn in either direction for the most pleasing tone.

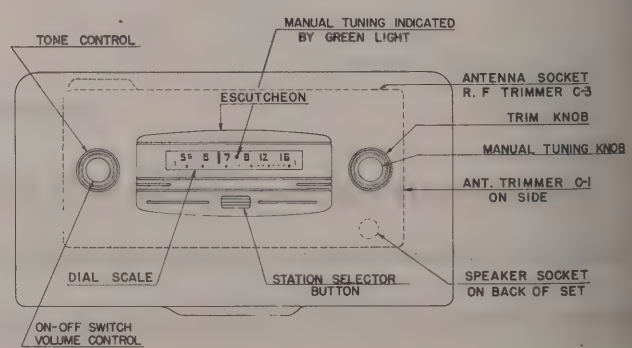


Fig. 2. Front View

AUTOMATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

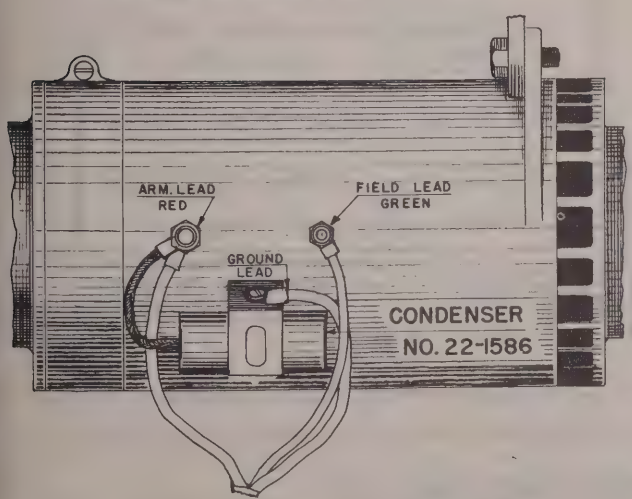
1. Press the station selector push button repeatedly until the green dot in the dial scale is illuminated.
2. Press the button once more to move the mechanism to the No. 1 Position.
3. Pull manual tuning knob outward to engage the automatic mechanism.
4. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.
5. Press the station selector push button, pull the manual tuning knob outward, and tune in the station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the station selector push button to return to dial tuning, or any one of the stations adjusted on the Automatic.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The generator condenser No. 22-1586 should be installed as shown below in figure 3.



MOUNT CONDENSER NO. 22-1586 UNDER GENERATOR GROUND LEAD SCREW

Fig. 3

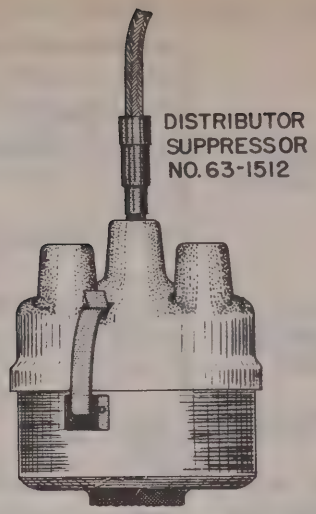


Fig. 4

The distributor suppressor No. 63-1512 should be connected as shown above in figure 4.

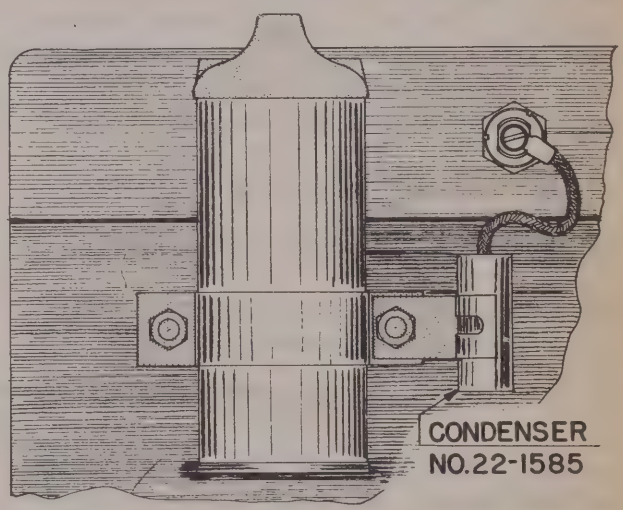


Fig. 5

The No. 22-1585 temperature gauge condenser should be installed as shown in figure 5.

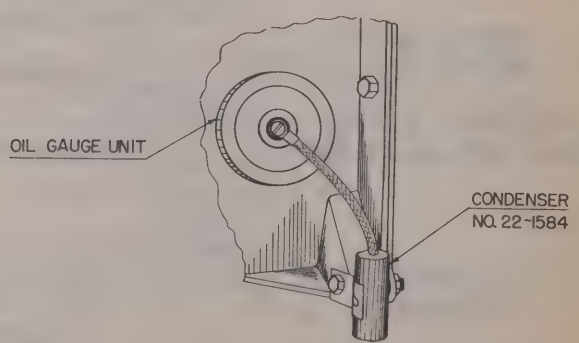


Fig. 6. Oil Gauge Cond.

The oil gauge condenser should be installed as shown in figure 6.

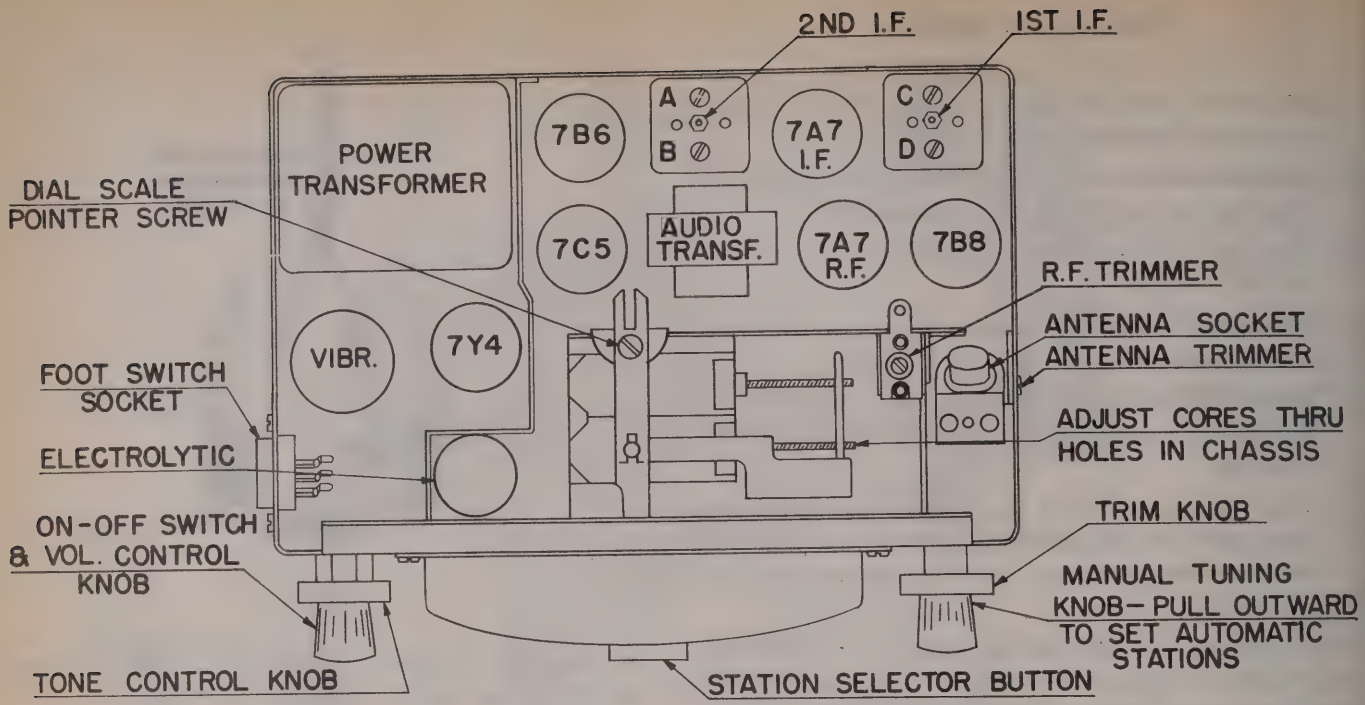


Fig. 7. Top View of Chassis

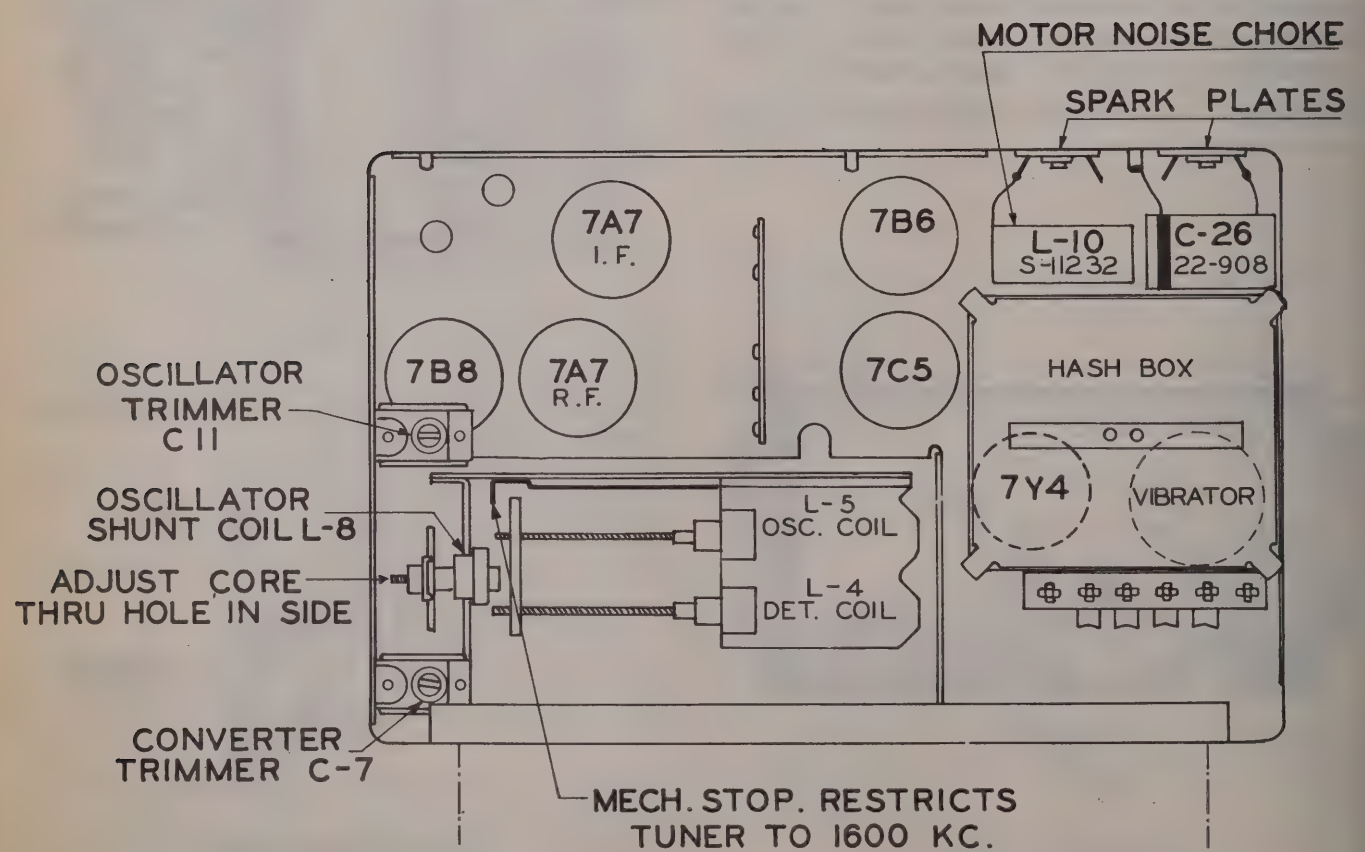


Fig. 8. Bottom View of Chassis

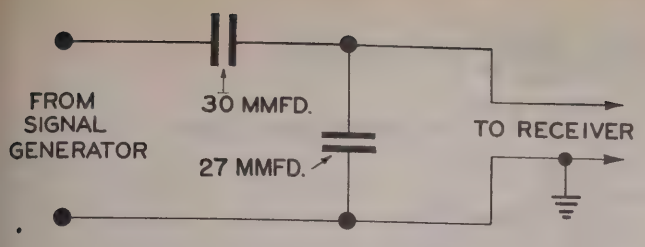


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1—Remove top and bottom covers from receiver.

2—Set signal generator to 265 Kc.

3—Apply signal from generator through a .1 Mfd. dummy to 7B8 coverter grid. (Pin No. 6 on socket.)

4—Adjust I.F. trimmers, A, B, C and D (Fig. 7) in the order named for maximum output. Repeat the operation to assure accurate alignment.

R.F. AND OSCILLATOR ALIGNMENT

1—Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver.

2—Set signal generator to 535 Kc.

3—Place set in manual tuning position and set dial to 535 Kc.

4—Adjust oscillator trimmer C-11 (Fig. 8) for maximum response.

5—Set signal generator to 1200 Kc.

6—Tune set to 1200 Kc.

7—Adjust converter trimmer C-7 (Fig. 8) and R.F. trimmer C-3 (Fig. 7) for maximum response.

8—If dial calibration is off after making above adjustments, a correction can be made by turning the slotted brass screw at the rear of the pointer bracket.

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

1—Replace coil or core.

2—Set signal generator to 1700 Kc.

3—Connect signal generator leads through dummy, illustrated in Figure 9, to antenna receptacle on the receiver.

4—Set receiver dial to 1600 Kc. (maximum high frequency end of dial.)

5—Screw the core completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.

6—Adjust oscillator trimmer C-11 (Fig. 8) at 1700 Kc.

7—Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 7 and 8) for maximum output reading.

8—Replace cores to their approximate original position.

9—Set generator dial and receiver dial to 1200 Kc.

10—Adjust oscillator core L-5 (Fig. 8) to scale at 1200 Kc.

11—Adjust the antenna core, R.F. core, and converter core (Fig. 7 and 8) for maximum output reading.

12—Set signal generator to 600 Kc.

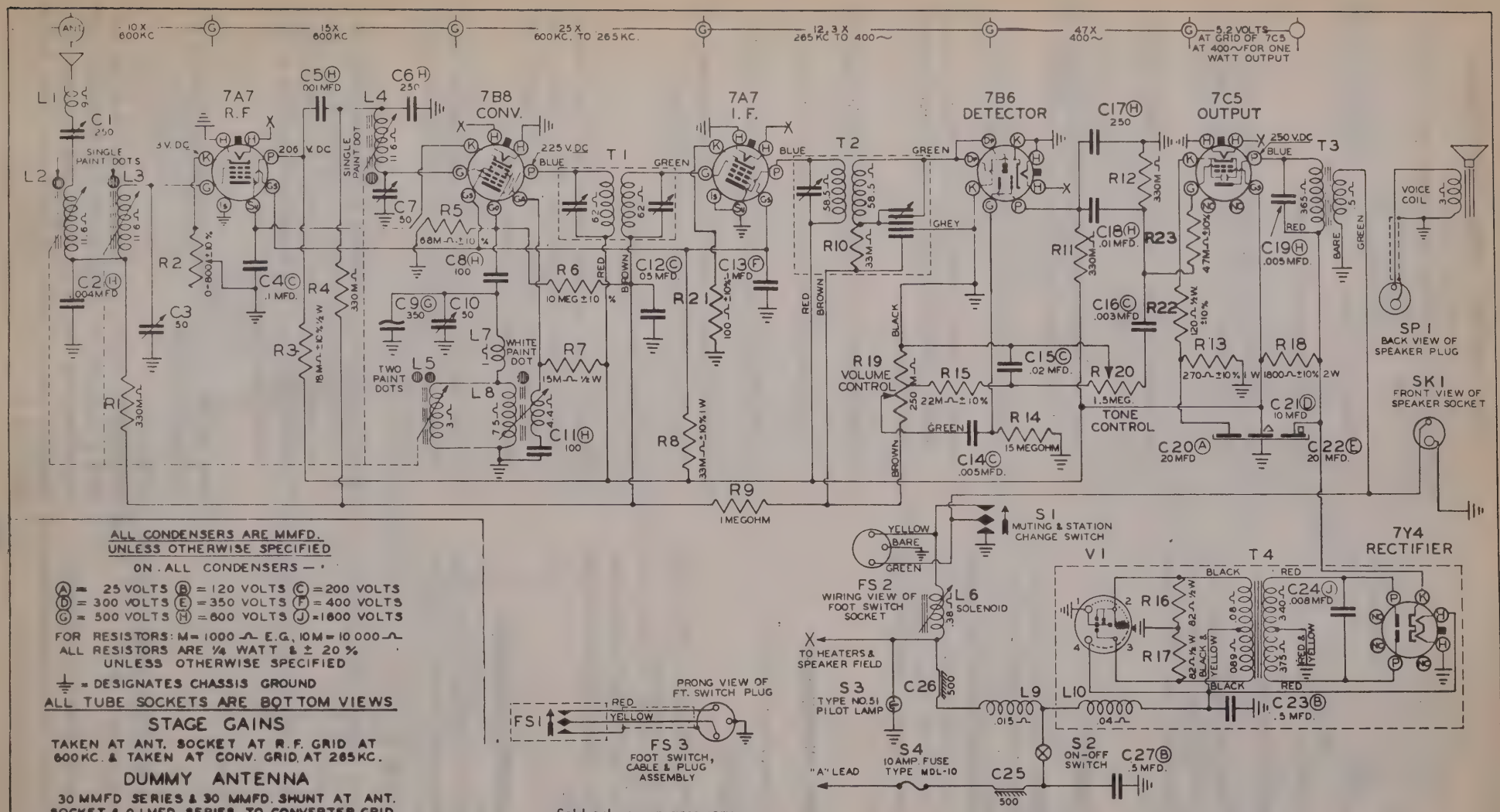
13—"Rock in" shunt oscillator coil L-8 (Fig. 8) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a ganged condenser receiver.

14—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.

15—After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station near 1200 Kc.



ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED

ON ALL CONDENSERS —

(A) = 25 VOLTS (B) = 120 VOLTS (C) = 200 VOLTS
(D) = 300 VOLTS (E) = 350 VOLTS (F) = 400 VOLTS
(G) = 500 VOLTS (H) = 600 VOLTS (J) = 1600 VOLTS

FOR RESISTORS: M = 1000 Ω E.G. 10M = 10 000 Ω
ALL RESISTORS ARE ¼ WATT & ± 20 % UNLESS OTHERWISE SPECIFIED

⏚ = DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANT. SOCKET AT R.F. GRID AT 600 KC. & TAKEN AT CONV. GRID AT 265 KC.

DUMMY ANTENNA

30 MMFD SERIES & 30 MMFD. SHUNT AT ANT. SOCKET & 0.1 MFD. SERIES TO CONVERTER GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOL. CONTROL SET AT "MAX." TONE CONTROL SET ON "HIGH"; WITH NO INCOMING SIGNAL

VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

Sold only as an accessory.

SCHEMATIC DIAGRAM FOR 6 TUBE
WILLY'S 6MW083
WITH FOOT CONTROL
I. F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS
U. S. A.

PARTS LIST MODEL 6MW083 (CHASSIS 6C83)

1946 WILLYS OVERLAND LONG DISTANCE RADIO

COILS AND CHOKES

Diagram No.	Part No.	Description
L 9	20-213	Main Hash Choke
T 1	95-916	1st I.F. Transformer
T 2	95-942	2nd I.F. Transformer
L 1	S8819	Ant. Motor Noise Choke Assem.
L 2, L 3	S11040	Ant. & R.F. Coil Assem. (Right Hand)
L 4, L 5	S11041	Osc. & Converter Coil Assem. (Left Hand)
L 7	S11229	Osc. Series Coil Assem.
L 8	S11231	Osc. Shunt Coil Assem.
L10	S11232	Motor Noise Choke Coil Assem.

CONDENSERS

C 8, C11	22-162	100 Mmfd.	600 V.
C13	22-170	.1 Mfd.	400 V.
C17	22-182	250 Mmfd.	600 V.
C 4	22-190	.1 Mfd.	200 V.
C12	22-250	.05 Mfd.	200 V.
C19	22-838	.005 Mfd.	600 V.
C14	22-906	.005 Mfd.	200 V.
C23, C27	22-908	.5 Mfd.	120 V.
C 6	22-1136	250 Mmfd.	600 V.
C 5	22-1169	.001 Mfd.	600 V.
C18	22-1170	.01 Mfd.	600 V.
C16	22-1180	.003 Mfd.	600 V.
C 2	22-1244	.004 Mfd.	600 V.
C15	22-1270	.02 Mfd.	200 V.
C 3	22-1376	R.F. Trimmer	
C 7	22-1377	Det. Trimmer	
C10	22-1378	Osc. Trimmer	
C20, C21, C22	22-1387	Dry Electrolytic—20 Mfd. 25 V. x 10 Mfd.—300 V. x 20 Mfd. 350 V.	
C 1	22-1420	Ant. Trimmer	
C24	22-1448	.008 Mfd.	1600 V.
C 9	22-1478	350 Mmfd. Compensator	
	22-1553*	Dry Electrolytic—20 Mfd.—25 V.	
	22-1554*	Dry Electrolytic—10 Mfd.—300 V. x 20 Mfd.—350 V.	
C25	27-87	Spark Plate	
C26	27-87	Spark Plate	

*Note: It is necessary to use one each 22-1553 and 22-1554 to replace one 22-1387.

RESISTORS

R 2	63-1267	Sensitivity Control (Sub. for 63-1379)	
R18	63-1368	1800 Ohm, 2 Watt Insl. W.W.	
R13	63-1369	270 Ohm, 1 Watt Insl. W.W.	
R 2	63-1379	Sensitivity Control	
R 9	63-1390	1 Megohm	¼ Watt.
R 1, R 4, R11, R12	63-1392	330M Ohm	¼ Watt.
R15	63-1395	22M Ohm	¼ Watt.
R 5	63-1396	68M Ohm	¼ Watt.
R 8	63-1398	33M Ohm	1 Watt.
R16, R17	63-1399	82 Ohm	½ Watt.
R14	63-1400	15 Megohm	¼ Watt.
R 7	63-1401	15M Ohm	½ Watt.
R22	63-1410	120 Ohm	½ Watt.
R 3	63-1411	18M Ohm	½ Watt.
R 6	63-1413	10 Megohm	¼ Watt.
R21	63-1414	100 Ohm	¼ Watt.
R23	63-1417	47M Ohm	¼ Watt.
R19, R20	63-1508	Tone Con., Vol. Con. & Switch	

MISCELLANEOUS

	19-114	Foot Sw. Cable Retaining Clip
	46-624	Selector Sw. Knob
	52-294	Vol. Con. Cable
	52-398	Battery Cable (Set to Fuse)
	52-399	Battery Cable (Fuse to Ammeter)
	57-1173	Escutcheon
	78-281	Vibrator Socket (or 78-732-733)
	78-596	Loktal Tube Socket (or 78-717-726-729-730)
FS 2	78-646	Foot Sw. Cable Socket (or 78-406)
SK 1	78-728	Speaker Cable Socket
	80-232	Vol. Con. Knob Retaining Spring
	80-454	Selector Knob Spring
T 4	95-914	Power Transformer (Alt. for 95-1013)
T 3	95-915	Output Transformer
T 4	95-1013	Power Transformer
	112-310	Foot Sw. Mtg. Screw
S 4	136-14	Fuse—10 Amp.—Type MDL—10
V 1	190-20	Vibrator
	202-430	Instruction Book
FS 3	S12042	Foot Sw., Cable & Plug Assem.
FS 1	S-9458	Foot Switch & Plate Assembly

*Note: Not used in production. Sold only as an accessory.

DIAL AND TUNING MECHANISM ASSEMBLY

26-385	Dial Scale
34-132	Indexing Disc
34-138	Tuning Gear
34-158	Ratchet Gear
56-174	Indicator Pin
57-1077	Protector Plate
59-180	Dial Pointer
76-378	Guide Rod
80-329	Gear Indexing Spring

DIAL AND TUNING MECHANISM ASSEMBLY (Continued)

Diagram No.	Part No.	Description
	80-331	Cross Arm Return Spring
	80-332	Cam Lever Spring
	80-336	Ratchet Gear Return Spring
	80-340	Lever Spring
	80-341	Kick-off Spring
	80-342	Tuning Shaft Spring
	80-379	Pointer Retainer Spring
	80-445	Flag Spring
	83-1030	Return Spring Retainer Strip
	83-1039	Solenoid Insulating Strip
	86-30	#6 Shakeproof Terminal
	93-125	#6 Internal Shakeproof Lockwasher
	93-501	#4 Internal Shakeproof Lockwasher
	93-631	Retainer Washer
	93-650	Brass Washer (.010 x 3/16 x 7/16)
	93-706	Neoprene Washer (.020 x 7/16 x 3/4)
	93-822	Brass Washer (.008 x .125 x 7/32)
	93-849	Shim Washer
	94-438	Spacing Bushing
	97-193	Lever Stud
	97-236	Flag Stud
S3	100-32	Dial Light Bulb
	114-63	#6-32 x 3/16 Hex Acorn Hd. M.S.
	114-69	#4-40 x 1/4 Hex Acorn Hd. M.S.
	114-150	#6-32 x 5/32 Hex Acorn Hd. M.S.
	117-83	Tuning Shaft Locking Lever
	128-26	Dial Indicator Cam
	147-126	Gear & Disc Spacer
	149-44	Adjusting Spring & Core
	S10826	Solenoid End Plug & Bracket Assem.
	S10829	Solenoid & Terminal Assem.
	S10381	Ratcher & Bracket Assem.
	S10836	Cross Arm Assem.
	S11056	Tuning Shaft & Gear Assem.
	S11076	Push-Pull Tuner Assem. (complete)
	S11082	Turret Assem.
S1	S11271	Solenoid Sw. Assem. (Hand Selector & Muting)
	S11391	Antenna Connector Socket & Bracket Assembly
	S12438	Mounting Plate & Lever Assem.
	S12439	Pointer Mounting Bracket & Stud Assem.
	S12440	Pointer Drive Bracket & Stud Assem.
	S12447	Dial Light Socket & Wire Assem.
	S12909	Indicator Flag & Bracket Assem. (59-186)
	S12911	Front Plate & Bushing Assem.

SET INSTALLATION AND SUPPRESSION KIT

Diagram Part No.		Description
	S13597	Set Installation & Suppression Kit (complete)
	12-1314	Set Installation Bracket
	22-1584	Oil Gauge Cond. (.5 Mfd.—200 V.)
	22-1585	Temp. Gauge Cond. (.5Mfd.—200 V.)
	22-1586	Generator Cond. (1 Mfd.—200 V.)
	54-68	5/16 x 9/16 x 7/32 Hex Nut
	54-104	1/4-20 x 1/2 x 3/16 Hex Nut
	54-153	7/16-28 x 19/32 x .120 Hex Nut
	63-1512	Distributor Suppressor
	80-145	Motor Hood Bond Spring
	93-139	5/16 External Shakeproof Lockwasher
	93-161	1/4 External Shakeproof Lockwasher
	93-444	1/16 x 3/8 x 1 3/4 Steel Washer
	93-577	.062 x 17/64 x 3/4 Steel Washer
	112-365	#8 x 1/2 B.H. Sheet Metal Screw
	114-281	1/4-20 x 5/8 Hex Hd. M.S.
	147-144	Specker Mounting Spacer
	188-41	Spacer Ring

KNOB KIT

	S13174	Knob Kit (complete)
	S12910	Tuning & Trim Knob Assem.
	S13-239	Vol. Con. Knob & Spring Assem.
	46-635	Tone Con. Knob

SPEAKER AND SPEAKER MOUNTING PARTS

	43-131	Speaker Housing
SP 1	49-566	7.6" PM Speaker & Cable 208-566 Cone & Voice Coil
	54-30	8/32 x 5/16 x 7/64 Hex Nut
	74-41	Speaker Screen
	93-126	#8 Internal Shakeproof Lockwasher
	93-783	Stat. Bronze Steel Washer (1/32 x 3/16 x 3/8)
	112-248	#8-32 x 5/8 Oval B.H.M.S.
	147-85	Spacer
	S13066	Speaker Mounting Bracket & Stud Assem.
	S13510	Complete Speaker & Housing Assem.

Note: When ordering cone and voice coil marked * be sure to add manufacturers' code letter that follows base part number.

PRINTED IN U. S. A.

SERVICE MANUAL

ZENITH

REG U.S. PAT. OFF.

Model 7ML080
Lincoln Part No. 5EH-18805-A

ADJUST-O-MATIC RADIO

Model 7ML081
Continental Part No. 5EH-18805-B

Made for LINCOLN by ZENITH RADIO CORPORATION, CHICAGO 39, ILL., U.S.A.

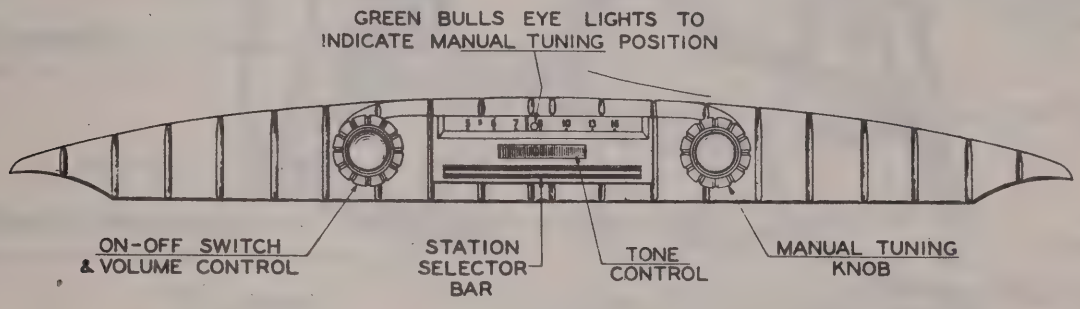

GREEN BULLS EYE LIGHTS TO INDICATE MANUAL TUNING POSITION
ON-OFF SWITCH & VOLUME CONTROL
STATION SELECTOR BAR
TONE CONTROL
MANUAL TUNING KNOB

Fig. 1. Lincoln

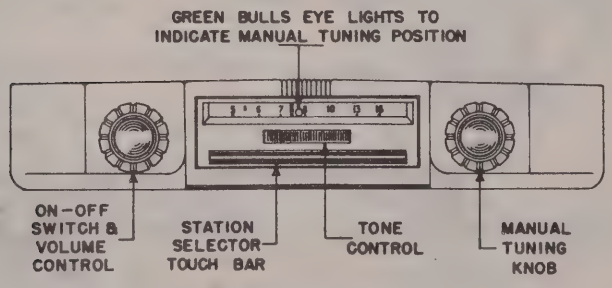

GREEN BULLS EYE LIGHTS TO INDICATE MANUAL TUNING POSITION
ON-OFF SWITCH & VOLUME CONTROL
STATION SELECTOR TOUCH BAR
TONE CONTROL
MANUAL TUNING KNOB

Fig. 1A. Continental

Electrical Specifications

TUNING RANGE: ..... 540-1600 Kc.
INTERMEDIATE FREQUENCY: ..... 265 Kc.
SENSITIVITY: ..... 6 microvolts at one watt output.
UNDISTORTED POWER OUTPUT: ..... 7.5 watts measured at the voice coil.
SPEAKER: ..... 6" x 9" oval, instrument panel mounting.
CURRENT CONSUMPTION: ..... 8.5 amperes
INSTANTANEOUS CURRENT CONSUMPTION DURING AUTOMATIC CHANGE CYCLE: ..... 20 amperes
TUBE COMPLEMENT: ..... 7A7 R.F., 7B8 converter, 7A7 I.F., 7E6 detector and 1st audio, 2-7C5 push pull power output, 7Y4 rectifier.

IMPORTANT

The Warranty Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

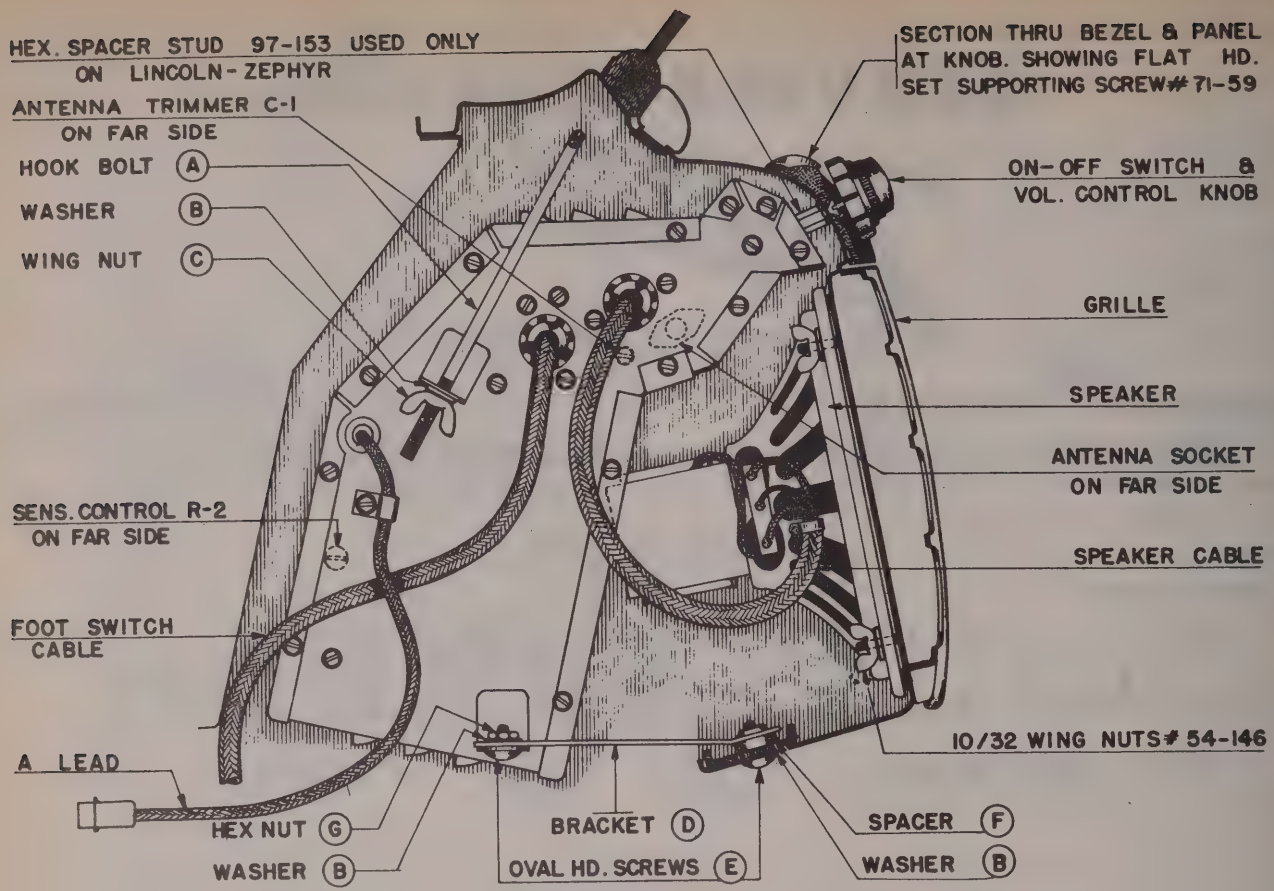

HEX. SPACER STUD 97-153 USED ONLY ON LINCOLN-ZEPHYR
ANTENNA TRIMMER C-1 ON FAR SIDE
HOOK BOLT A
WASHER B
WING NUT C
SECTION THRU BEZEL & PANEL AT KNOB. SHOWING FLAT HD. SET SUPPORTING SCREW # 71-59
ON-OFF SWITCH & VOL. CONTROL KNOB
GRILLE
SPEAKER
ANTENNA SOCKET ON FAR SIDE
SENS. CONTROL R-2 ON FAR SIDE
SPEAKER CABLE
FOOT SWITCH CABLE
10/32 WING NUTS # 54-146
A LEAD
HEX NUT G
WASHER B
BRACKET D
OVAL HD. SCREWS E
SPACER F
WASHER B

Fig. 2. Lincoln

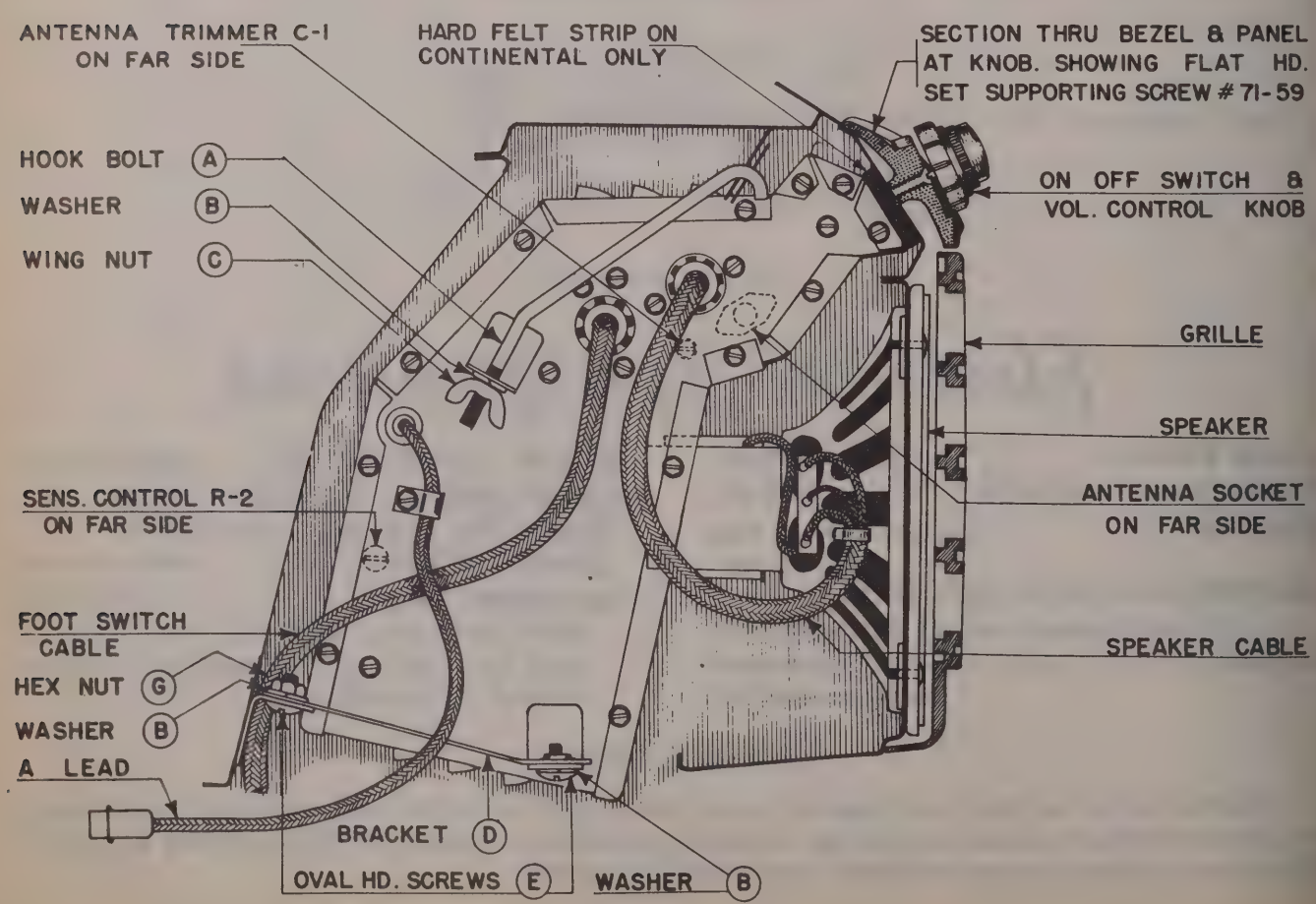


Fig. 2A. Continental

RECEIVER INSTALLATIONS

Figures 1, 1A, 2 and 2A, illustrating the escutcheon plates, control knobs and the installed receivers, are given here to facilitate removal and reinstallation of the receivers when service or repair is necessary.

To take the receiver from the car, remove the tuning and volume control knobs. Remove the 8-32 flathead screws that support the receiver at the top. Remove the lower support brackets "D" and finally loosen the hook bolts "A."

To remove the Continental speaker, remove grille (held in place by four nuts on back side of instrument panel). Then remove four machine screws No. 69-84 holding the speaker to the front of the instrument panel. (Fig. 2A.)

The Lincoln speaker is held to the rear of the panel by four wing nuts No. 54-146. (Fig. 2.)

MANUAL TUNING

1. Press station selector touch-bar (Fig. 1) several times or until the green dot appears in the back ground of the dial.

2. Pull manual tuning (right hand) control knob outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust left hand control knob for desired volume.

TONE CONTROL—The tone control is located under dial scale. (Fig. 1.) Turn in either direction for most pleasing tone.

ADJUST-O-MATIC TUNING

If not previously set up for Adjust-O-Matic operation, proceed as follows:

1. Press station selector touch bar (Fig. 1) until green dot appears in dial scale background. Press the touch bar once more to advance Adjust-O-Matic mechanism to the No. 1 position.

2. Pull manual tuning knob outward to engage the Adjust-O-Matic mechanism.

3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.

4. Press station selector bar, pull tuning knob outward and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five Adjust-O-Matic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the selector bar to return to dial tuning or to any one of the stations selected on the Adjust-O-Matic.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The two ignition coil condensers No. 22-1147 should be installed as shown in Figure 3 below.

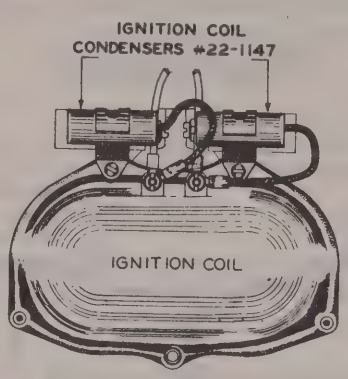


Fig. 3

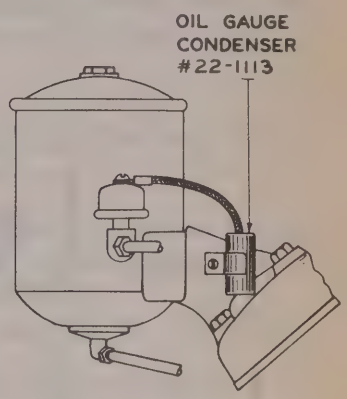


Fig. 4

The oil gauge condenser No. 22-1113 should be installed as shown in Figure 4.

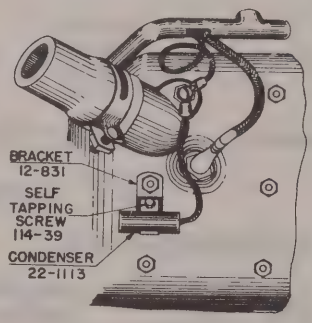
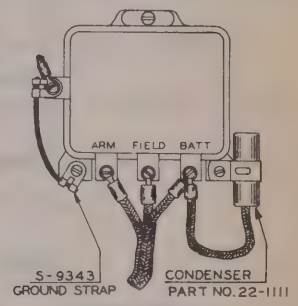


Fig. 5



CONDENSER ON VOLTAGE REGULATOR

Fig. 6

The temperature gauge condenser No. 22-1113 should be installed with its bracket fastened under one of the cylinder head nuts as shown in Figure 5.

The voltage regulator condenser and ground strap should be installed as shown in Figure 6.

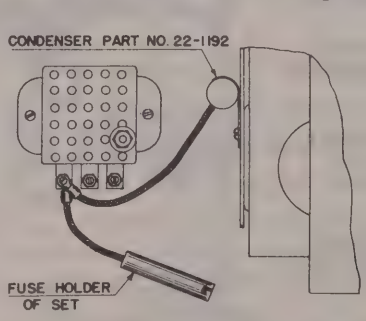


Fig. 7

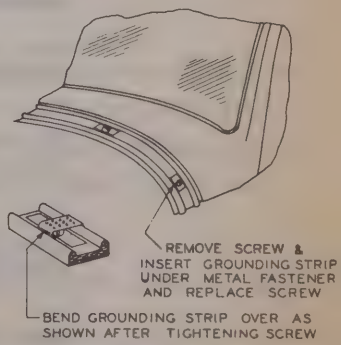


Fig. 8

The No. 22-1192 condenser and the "A" lead should be connected together at the circuit breaker inside the car above the steering column as shown in Figure 7.

The No. 80-145 motor hood bond spring should be installed as illustrated in Figure 8.

DELAYED AUTOMATIC MUTING CIRCUIT

Pressing the touch-bar or the foot control switch automatically mutes the receiver during the station changing cycle. After the hand or foot pressure is removed, the noise of tuning through stations on the return stroke is eliminated automatically. This special circuit applies a large negative voltage to the 1st audio grid to bias it beyond cut off. When the tuner is operated, the delayed muting switch S3 on the back of the tuner connects the grid side of the condenser C19 to ground and charges it positively. As soon as the tuner starts its return stroke, the switch grounds the positive terminal of the condenser and ungrounds the grid side. The grid side now becomes negative with respect to ground and cuts off the 1st audio tube. The charge rapidly leaks off through R12 and R14, and the receiver operates normally after the change cycle.

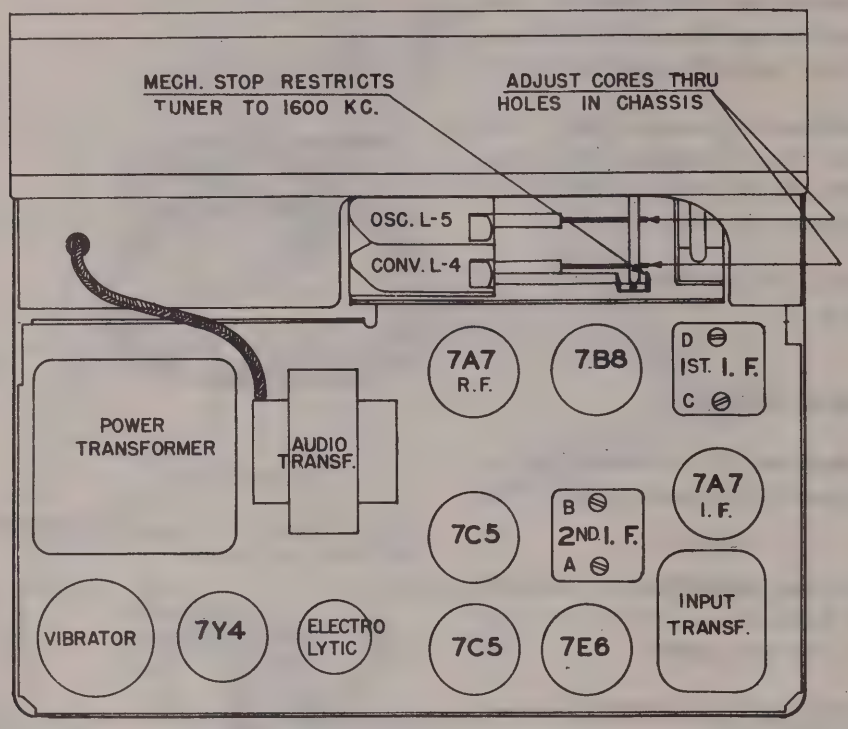


Fig. 9. Top View of Chassis

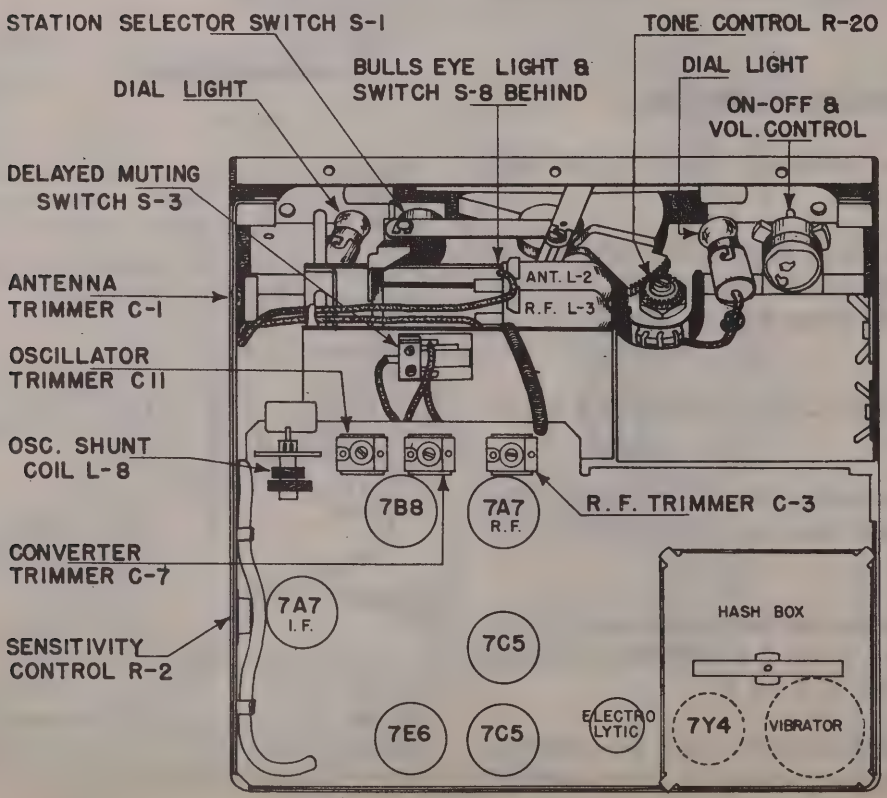


Fig. 10. Bottom View of Chassis

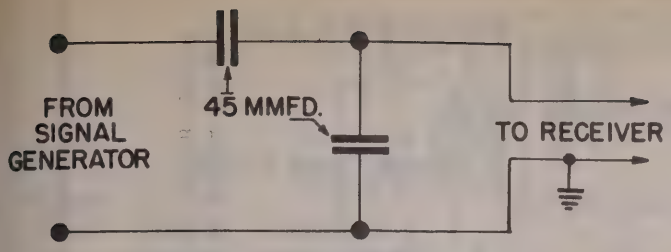


Fig. 11

Figure 11 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C and D (Fig. 9) in the order named for maximum output. Repeat the operation to assure accurate alignment.

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy illustrated in Fig. 11 to antenna lead in socket on receiver.
2. Set signal generator to 535 Kc.
3. Place set in manual tuning position and set dial to 535 Kc.
4. Adjust oscillator trimmer C-11 (Fig. 10) for maximum response.
5. Set signal generator to 1200 Kc.
6. Tune set to 1200 Kc.
7. Adjust converter trimmer C-7 (Fig. 10) and R.F. trimmer C-3 (Fig. 10) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by turning eccentric screw at fulcrum of dial pointer.

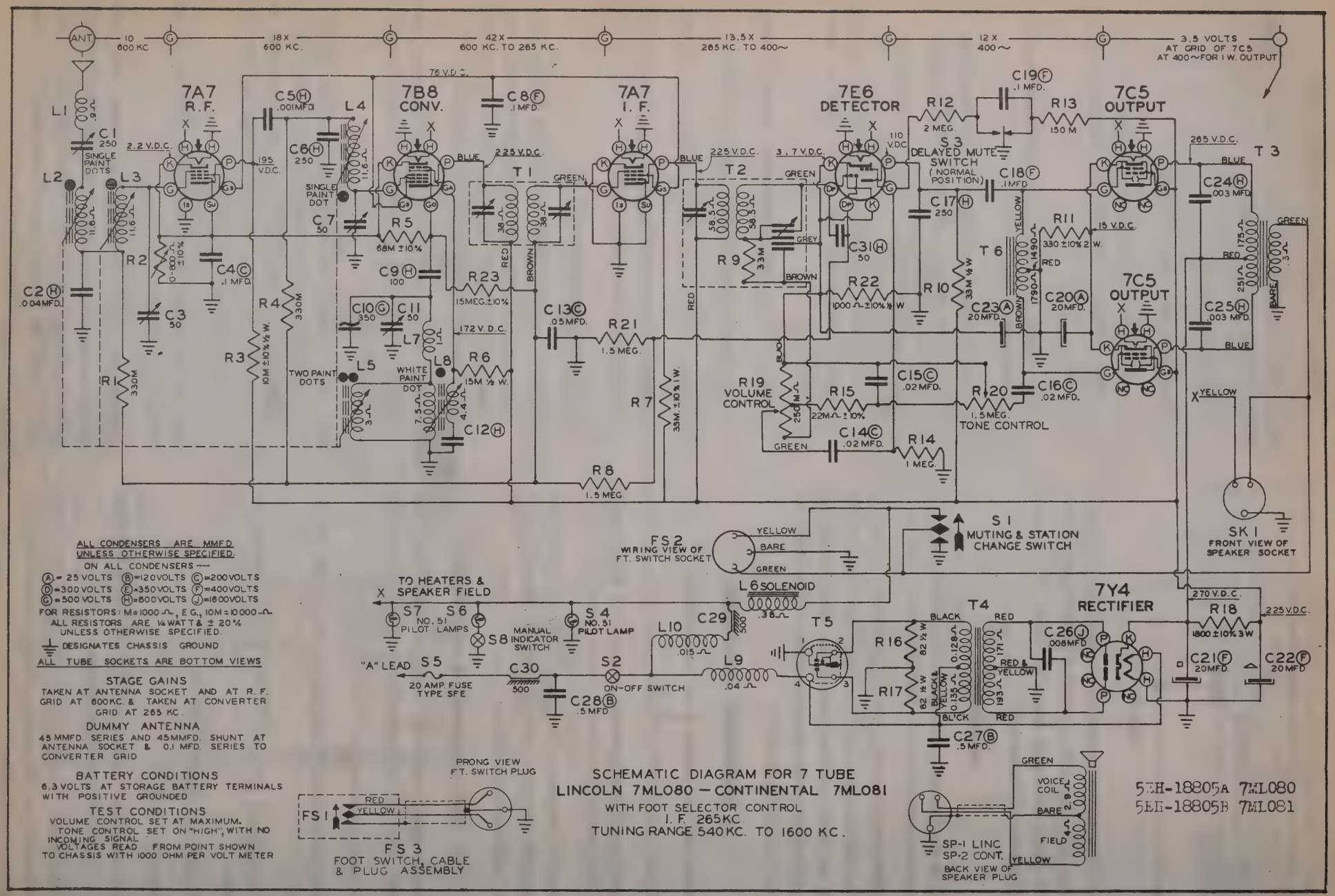
CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

1. Replace coil or core.
2. Set signal generator to 1700 Kc.
3. Connect signal generator leads through dummy illustrated in Figure 11 to antenna receptacle on the receiver.
4. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
5. Screw the core complete out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
6. Adjust oscillator trimmer C-11 Fig. 10 at 1700 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 10) for maximum output reading.
8. Replace cores to their approximate original positions.
9. Set generator dial and receiver dial to 1200 Kc.
10. Adjust oscillator core L5 (Figure 9) to scale at 1200 Kc.
11. Adjust antenna, R.F. and converter cores (Figures 9 and 10) for maximum output reading.
12. Set signal generator to 600 Kc.
13. "Rock in" shunt oscillator coil L8 (Fig. 10) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a ganged condenser receiver.
14. Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
15. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc.


ANT
10 600 KC
18X 600 KC.
42X 600 KC. TO 265 KC.
13.5X 265 KC. TO 400~
12X 400~
3.5 VOLTS AT GRID OF 7C5 AT 400~ FOR 1 W. OUTPUT
7A7 R.F.
7B8 CONV.
7A7 I. F.
7E6 DETECTOR
7C5 OUTPUT
7C5 OUTPUT
7Y4 RECTIFIER
S3 DELAYED MUTE SWITCH (NORMAL POSITION)
R19 VOLUME CONTROL
R15 22M ± 10%
R20 1.5 MEG. TONE CONTROL
R14 1 MEG.
S1 MUTING & STATION CHANGE SWITCH
SK1 FRONT VIEW OF SPEAKER SOCKET
FS2 WIRING VIEW OF FT. SWITCH SOCKET
YELLOW
BARE
GREEN
TO HEATERS & SPEAKER FIELD
L6 SOLENOID
S7 NO. 51 PILOT LAMPS
S6
S8 MANUAL INDICATOR SWITCH
S4 NO. 51 PILOT LAMP
L10 .015
C29 500
T5
T4
R16 82 ½ W
R17 82 ½ W
C26 .008MFD
R18 1800 ± 10% 3W
C21 20MFD.
C22 20MFD
"A" LEAD
S5 20 AMP FUSE TYPE SFE
C30 500
S2 ON-OFF SWITCH
L9 .04
C28 .5 MFD
C27 .5 MFD.
PRONG VIEW FT. SWITCH PLUG
FS1
RED
YELLOW
FS 3 FOOT SWITCH, CABLE & PLUG ASSEMBLY
SCHEMATIC DIAGRAM FOR 7 TUBE LINCOLN 7ML080 — CONTINENTAL 7ML081
WITH FOOT SELECTOR CONTROL
I. F. 265KC.
TUNING RANGE 540KC. TO 1600 KC.
SP-1 LINC SP-2 CONT.
BACK VIEW OF SPEAKER PLUG
VOICE COIL
FIELD
5EH-18805A 7ML080
5EH-18805B 7ML081
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED.
ON ALL CONDENSERS —
(A)=25 VOLTS (B)=120 VOLTS (C)=200 VOLTS
(D)=300 VOLTS (E)=350 VOLTS (F)=400 VOLTS
(G)=500 VOLTS (H)=600 VOLTS (J)=1600 VOLTS
FOR RESISTORS: M=1000 Ω, E.G., 10M=10 000 Ω
ALL RESISTORS ARE ½ WATT & ± 20% UNLESS OTHERWISE SPECIFIED.
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT R. F. GRID AT 600KC. & TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
45 MMFD. SERIES AND 45MMFD. SHUNT AT ANTENNA SOCKET & 0.1 MFD. SERIES TO CONVERTER GRID
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM.
TONE CONTROL SET ON "HIGH", WITH NO INCOMING SIGNAL.
VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

SCHEMATIC

PARTS LIST LINCOLN MODEL 7ML080 (CHASSIS 7C80)

1946 ADJUST-O-MATIC RADIO

COILS AND CHOKES

Diagram No.	Part No.	Description
L 9	20-313	Main hash choke
T 1	95-944	1st I.F. transformer
T 2	95-945	2nd I.F. transformer
L 1	S8819	Antenna motor noise choke assem.
L 7	S11229	Oscillator series coil assem.
L 5	S12053*	Oscillator tuning coil assem.
L 2	S12060*	Antenna tuning coil assem.
L 3	S12060*	R.F. tuning coil assem.
L 4	S12060*	Converter tuning coil assem.
L 8	S11231*	Oscillator shunt coil assem.
L10	S12233	Motor noise choke coil assem.

Note: In ordering coils marked *, be sure to give color code information.

CONDENSERS

C 9, C12	22-162	100 mmfd.	600 volt
C 8, C19	22-170	.1 mfd.	400 volt
C-17	22-182	250 mmfd.	600 volt
C- 4	22-190	.1 mfd.	200 volt
C-13	22-250	.05 mfd.	200 volt
C-31	22-289	50 mmfd.	600 volt
C-27, C-28	22-908	.5 mfd.	120 volt
C- 6	22-1136	250 mmfd.	600 volt
C- 5	22-1169	.001 mfd.	600 volt
C 2	22-1244	.004 mfd.	600 volt
C14, C15, C16	22-1270	.02 mfd.	200 volt
C 1	22-1420	Antenna trimmer	
C26	22-1448	.008 mfd.	1600 volt
C10	22-1478	350 mmfd. compensator	
C 7, C11	22-1479	Oscillator and converter trimmer	
C 3	22-1480	R.F. trimmer	
C24, C25	22-1481	.003 mfd.	600 volt
C18	22-1482	.1 mfd.	400 volt
C23	22-1483	Dry electrolytic—20 mfd.—25 volt	
C20, C21, C22	22-1484	Dry electrolytic 20 mfd.—25 V. x 20 mfd.-400 V. x 20 mfd.-400 V.	

RESISTORS

R18	63-1370	1800 ohm	3 watt
R11	63-1371	330 ohm	2 watt
R 2	63-1379	Sensitivity control	
R20	63-1384	Tone control	
R19, S 2	63-1385	Volume control and switch	
R14	63-1390	1 megohm	¼ watt
R 1, R 4	63-1392	330M ohm	¼ watt
R15	63-1395	22M ohm	¼ watt
R 5	63-1396	68M ohm	¼ watt
R 7	63-1398	33M ohm	1 watt
R16, R17	63-1399	82 ohm	½ watt
R 6	63-1401	15M ohm	½ watt
R 3	63-1402	10M ohm	½ watt
R10	63-1404	33M ohm	½ watt
R12	63-1405	2 megohm	¼ watt
R23	63-1406	15 megohm	¼ watt
R 8, R21	63-1407	1.5 megohm	¼ watt
R13	63-1408	150M ohm	¼ watt
R22	63-1409	1M ohm	½ watt

MISCELLANEOUS

	19-87	Cable clip
SP1	49-543	6" x 9" dynamic speaker
	52-200	Battery cable fuse to ammeter
	52-350	Battery cable set to fuse
	78-477	Vibrator socket
	78-596	Tube socket—Loktal base (8 cont.)
SK1	78-645	Speaker plug socket
FS2	78-646	Foot switch cable plug socket
	78-251	Antenna connector socket
	93-456	Vibrator cushion washer
T 6	95-946	Input transformer
T 3	95-947	Output transformer
T 4	95-948	Power transformer
	97-235	Set installltion mounting stud
S 5	136-12	Fuse—20 amp.
T 5	190-22	Vibrator
	202-418	Instruction book
S 1	S11269	Hand selector & muting switch assem.
FS3	S12041	Foot switch cable & plug assem.
	208-543*	Cone and voice coil assembly

DIAL AND TUNING MECHANISM ASSEMBLY

12-970	Selector bar support bracket
12-1160	Light rod retaining bracket
26-353	Dial scale
34-122	Tone control gear
34-132	Indexing disc
34-133	Ratchet gear
57-1132	Dial scale back plate
57-1133	Escutcheon
73-69	No. 6-32 x 5/16 Allen head set screw
80-329	Gear indexing spring
80-331	Cross arm return spring
80-332	Cam lever spring

DIAL AND TUNING MECHANISM ASSEMBLY (Continued)

Diagram No.	Part No.	Description
	80-336	Ratcher gear return spring
	80-340	Lever spring
	80-341	Kick-off spring
	80-342	Tuning shaft spring
	80-343	Solenoid switch spring
	80-344	Solenoid switch contact spring
	80-429	Indicator switch contact spring
	80-430	Indicator switch contact spring
	80-431	Selector bar tension spring
	97-156	Tone control knob retaining stud
S 4, S 6, S 7	100-32	Dial light bulb (3 used)
	118-34	Pointer drive link
	126-497	Manual indicator light shield
	126-498	Dial light shield
	128-22	Indicator cam
	149-44*	Adjusting spring and core
	187-7	Manual indicator light rod
	188-43	Retaining ring
	188-45	Turret screw lock ring
	S10826	Solenoid end plug & bracket assem.
L 6	S10829	Solenoid and terminal assem.
	S10831	Ratchet and bracket assem.
	S10836	Cross arm assem.
	S11054	Tuning shaft and gear assem.
	S11084	Turret assem.
	S12068	Tuning & volume control knob assem.
	S12069	Selector key bar & bracket assem. (46-588)
	S12073	Pointer and stud assem. (59-170)
	S12075	Pointer drive bracket & stud assem.
	S12183	Mounting plate and lever assem.
	S12195	Dial light socket & wire assem.—L.H.
	S12196	Dial light socket & wire assem.—R.H.
	S12197	Dial light socket & wire assem.—Manual ind.
	S12232	Tone control knob & bushing assem. (46-589)

Note: In ordering Adjusting Spring and Core marked *, be sure to give color code information.

MOTOR NOISE SUPPRESSION KIT

	S12125	Motor noise suppression kit complete
	S-9343	Ground strap
	12-831	Suppressor condenser mtg. bracket
	22-1111	Voltage regulator condenser
	22-1113	Water gauge & oil gauge condenser
	22-1147	Ignition coil condenser
	22-1192	"A" lead condenser
	80-145	Motor hood bond spring
	114-39	No. 8 x ¼ hex head S.T. screw

INSTALLATION PARTS

	S12126	Set installation kit complete
	12-972	Set installation bracket
	19-114	Foot switch cable clip
	54-99	No. 12-24 x 7/16 hex nut
	54-146	No. 10-32 wing nut (4 used)
	54-151	No. 12-24 wing nut (2 used)
	64-141	Foot switch installation eyelet
	68-4	No. 6 Allen head set screw wrench
	71-59	No. 8-32 x ½ flat head M.S.
	93-340	3/32 x .255 x ½ washer (steel)
	93-372	No. 12 int. shakeproof lockwasher
	93-524	Foot switch installation washer
	112-310	No. 10 x 2 R.H. S.M. screw
	112-342	No. 12-24 x 5/8 B.H. M.S.
	112-348	Set installation screw

PARTS LIST CONTINENTAL MODEL 7ML081 (CHASSIS 7C80)

1946 ADJUST-O-MATIC RADIO

The parts list for Model 7ML081 is the same as for Model 7ML080 with the following parts omitted and added:

ADD

Diagram No.	Part No.	Description
SP2	49-539	6" x 9" dynamic speaker
	112-545	Set installltion screw L.H.
	112-546	Set installation screw R.H.
	69-84	10/32 x ¼ R.H. M.S.
	71-29	8/32 x 7/8 F.H M.S.
	93-369	No. 10 internal shakeproof lockwasher
	93-593	7/16 external shakeproof lockwasher
	208-539*	Cone and voice coil

OMIT

Diagram No.	Part No.	Description
SP1	49-543	6" x 9" dynamic speaker
	97-235	Set installation mounting stud
	54-146	10/32 wing nut (4 used)
	71-59	8/32 x ½ flat head M.S.
	112-348	Set installation screw
	208-543	Cone and voice coil

When ordering cone and voice coil assembly marked*, be sure to give manufacturer's code letter that follows base number.

LINCOLN AUTOMOTIVE RECEIVER 7ML780
(CHASSIS 7D80) 6H-18805-A.

Same as Model 7ML080 (Chassis 7C80) except:

OMIT

26-353	Dial Scale	
57-1132	Dial Scale Back Plate	
63-464	1 Megohm	1/4 W. Insl.
63-763	22M Ohm	1/4 W. Insl.
63-769	68M Ohm	1/4 W. Insl.
63-1370	1800 Ohm	3 W. Insl. W.W.
100-32	Dial Light Bulb	
196-91	Speaker Screen & Gasket	
202-418	Instruction Book	
S-11231	Oscillator Shunt Coil Assem.	

ADD

26-388	Dial Scale	
57-1321	Dial Scale Back Plate	
63-1368	1800 Ohm	2 W. Insl. W.W.
74-44	Speaker Screen	
97-235	Set Installation Mtg. Stud	
100-36	Dial Light Bulb	
196-95	Speaker Gasket	
202-529	Instruction Book	
S-13449	Oscillator Shunt Coil Assem.	

LINCOLN-CONTINENTAL AUTOMOTIVE RECEIVER MODEL 7ML781 (CHASSIS 7D80) 6H-18805-B.

Same as Model 7ML780 (Chassis 7D80) except:

OMIT

49-539	6"x 9" Dynamic Spkr. (or 49-543-599)
74-44	Speaker Screen
97-235	Set Installation Mtg. Stud
196-95	Speaker Gasket
S-12041	Foot Switch Assem.
S-12126	Set Installation Kit

ADD

49-573	6"x 9" Dynamic Spkr. (or 49-609)
83-968	Speaker Protection Strip
83-1231	Set Cushion Strip (2 used)
S-12043	Foot Switch Assem.
S-12484	Set Installation Kit

SERVICE MANUAL

ZENITH
•LONG DISTANCE• AUTO RADIO

Models
8MF880
and
8MF980

Ford Part No.
8A-18805-B

Made by ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, U.S.A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....5 microvolts at one watt output.

UNDISTORTED POWER OUTPUT:.....
6 watts measured at the voice coil.

SPEAKER:.....6″ x 9″ oval, instrument panel mounting.

CURRENT CONSUMPTION:.....8 amperes

TUBE COMPLEMENT, Model 8MF980: 6BA6 R.F., 6SA7GT converter, 6BA6 I.F., 6SR7GT detector and 1st audio, 6SN7GT driver and phase-inverter, 2-6V6GT push pull power output, and 6X5GT rectifier.

TUBE COMPLEMENT, Model 8MF880: 7A7 R.F., 7B8 converter, 6BA6 I.F., 7E6 or 6SR7GT detector and 1st audio, 7AF7 driver and phase-inverter, 2-6V6GT push pull power output, and 7Y4 rectifier.

IMPORTANT

The Warranty Registration Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

Printed in U.S.A.—5M—6-48—C. P.

Form F-48-49

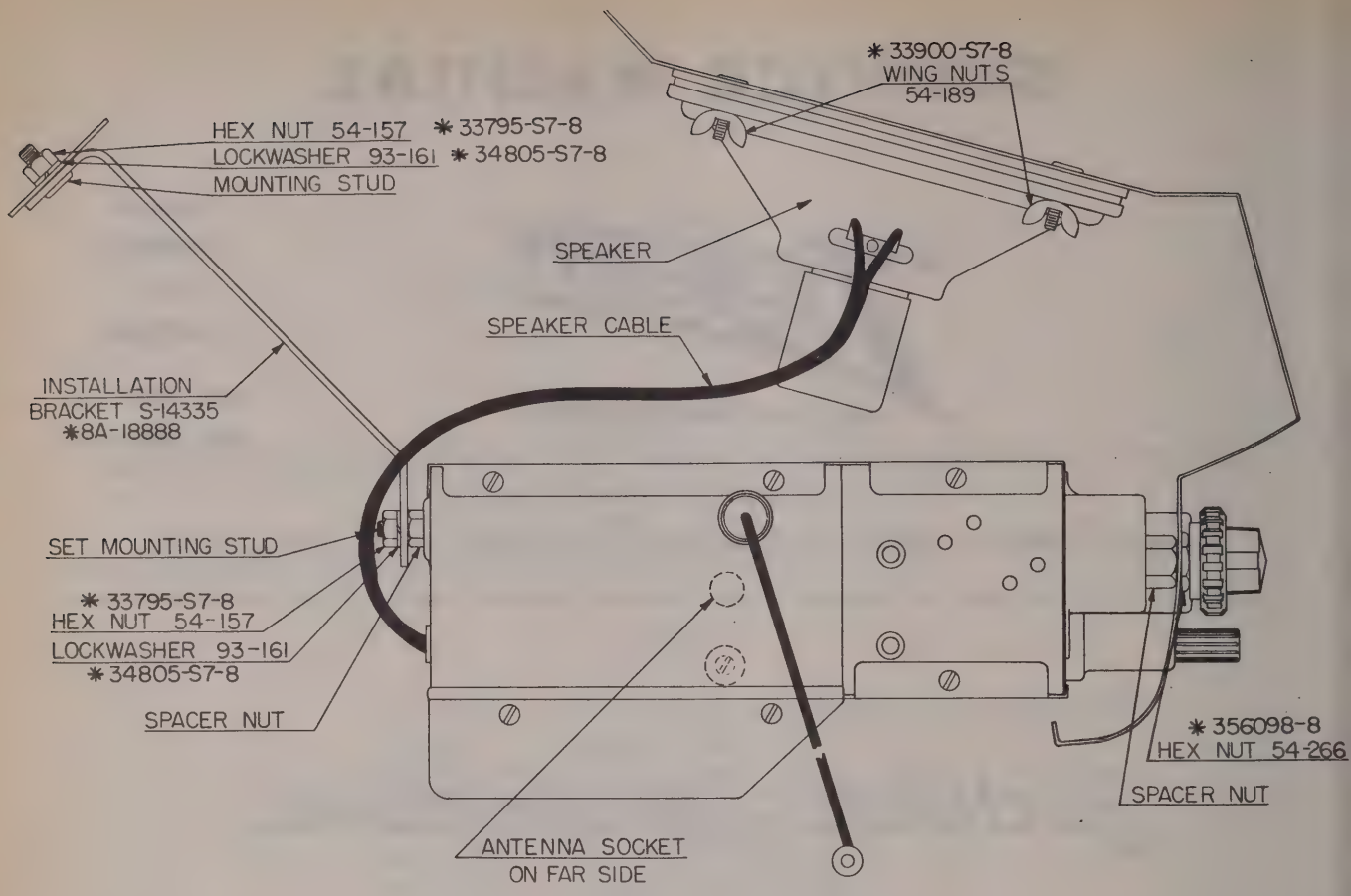


Fig. 1. Set Installed, Cut Away View

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the escutcheon plate, control knobs and the installed receiver, are given here to facilitate removal and reinstallation of the receiver when service or repair is necessary.

1. Disconnect the "A" lead, the speaker cable, and the antenna from the receiver. (Fig. 1.)
2. Remove the volume control, tone control, trim and tuning knobs from the set. Remove the two front hex-nuts 54-266. Disconnect the bottom of the set rear mounting bracket S-14335 by removing the hex-nut 54-157, and lockwasher 93-161 from the set rear mounting stud, and take the set from its position behind the instrument panel. (Fig. 1.)
3. To take the speaker from behind the instrument panel remove the four 8-32 wing-nuts No. 54-189. (Fig. 1.)

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push buttons. (Fig. 2.) Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push button (Fig. 2).

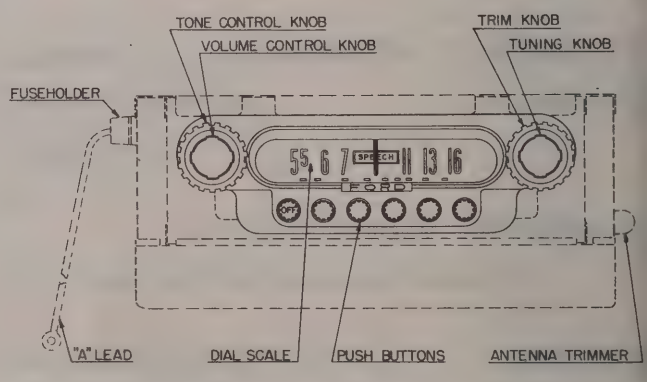


Fig. 2. Front Panel View

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Fig. 2.) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Fig. 2.)

TONE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

* Indicates Ford part number.

AUTOMATIC TUNING:

There are five automatic tuning push buttons located to the right of the "Off" push button. (Fig. 2.)

The five buttons may be adjusted in succession to any desired dial setting. To simplify the identification of the stations, it is advisable to set the buttons in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

To adjust the automatic tuning push buttons:

1. Turn the receiver on and allow it to operate for at least 15 minutes in order for each part to reach normal operating temperature.
2. Tune in the station desired for number 1 position by turning the tuning knob. (Fig. 2.) Be sure to tune to the exact frequency to insure the best tone.
3. Loosen the number one push button, located nearest the "OFF" push button (Fig. 2) by turning it counterclockwise with your fingers not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may come apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.
4. Press the button in as far as it will go.
5. Release the number 1 button and tighten it by turning it clockwise with your fingers.
6. Use the same procedure for adjusting positions 2, 3, 4, and 5. When the five automatic tuning push buttons have been adjusted to the five desired stations, any one of the five stations can be instantly tuned in by pressing the automatic push button that is adjusted to it.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

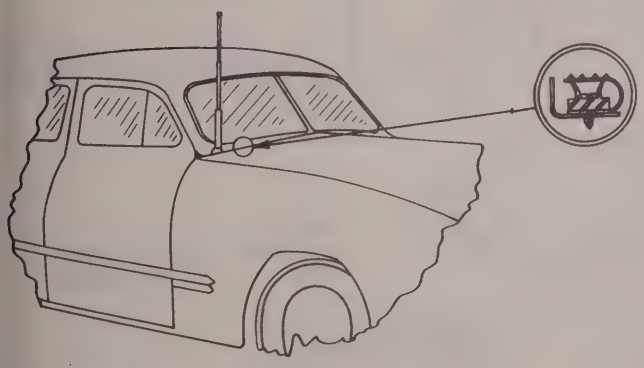

REMOVE SCREW FROM HOOD PAD ON COWL AT LOCATION SHOWN AND INSTALL HOOD BONDING SPRING 80-145 WITH SCREW 112-365. *51A-18870
*32923-S7-8

Fig. 3

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 3.

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 4.)

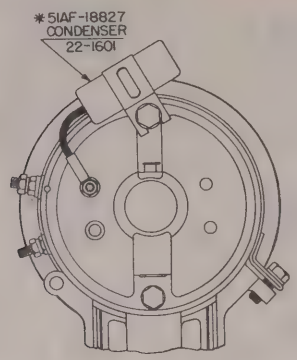


Fig. 4

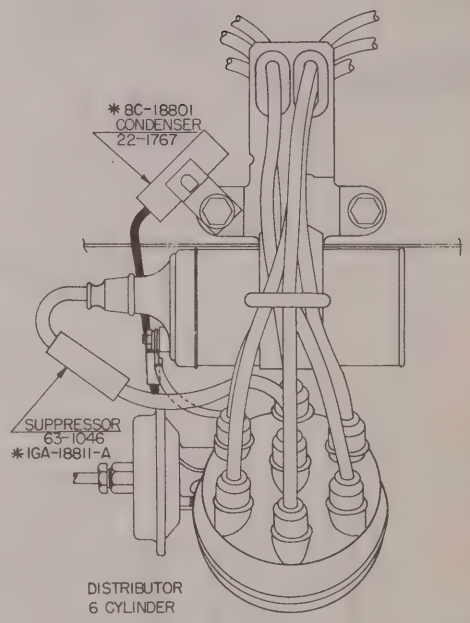


Fig. 5

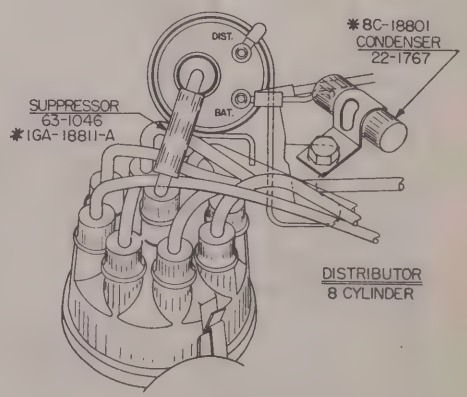


Fig. 6

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1½ inches from the distributor cap. (Figs. 5 and 6.) The ignition coil condenser, No. 22-1767, should be connected to the BAT, terminal of the ignition coil. (Figs. 5 and 6.)

* Indicates Ford part number.

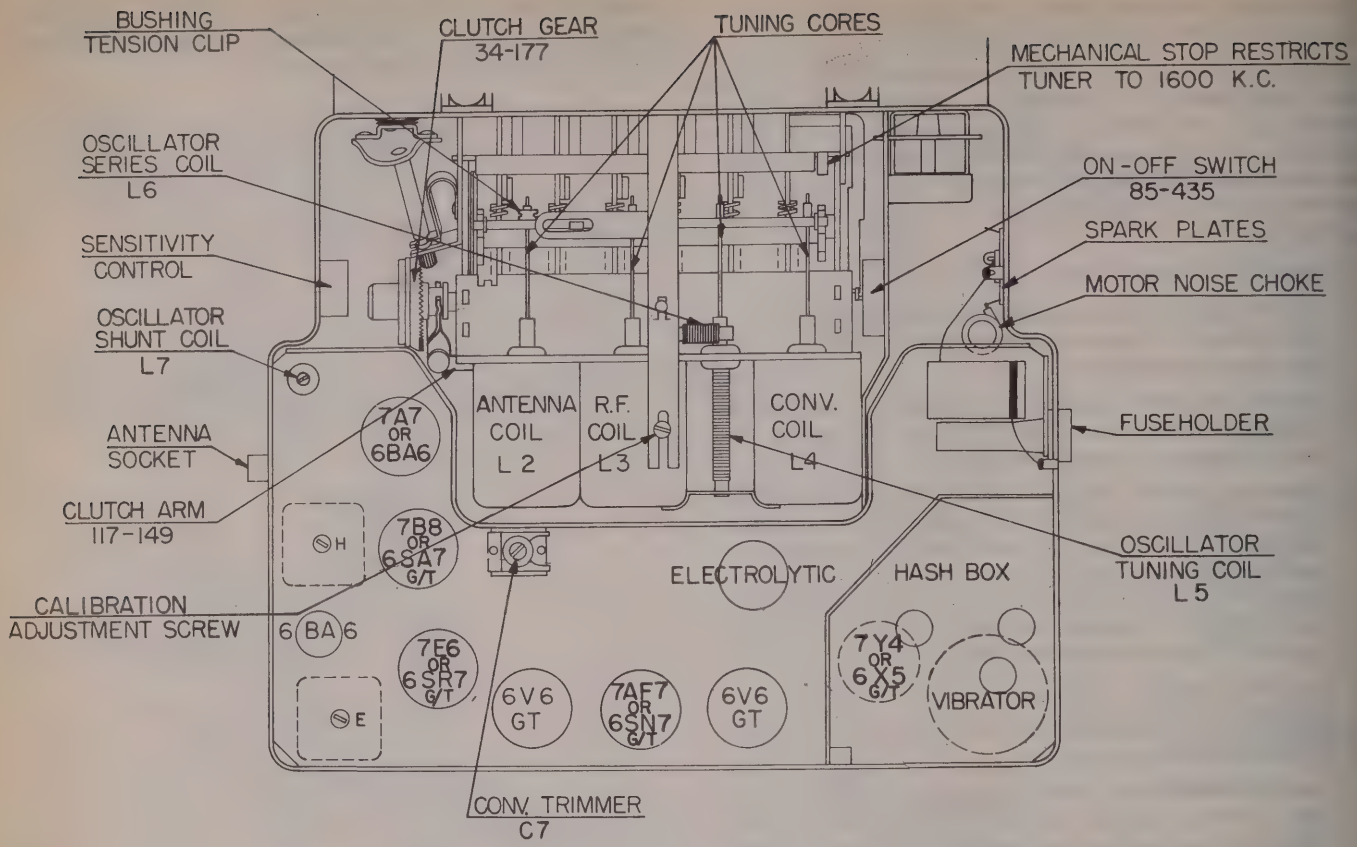


Fig. 7. Top View of Chassis

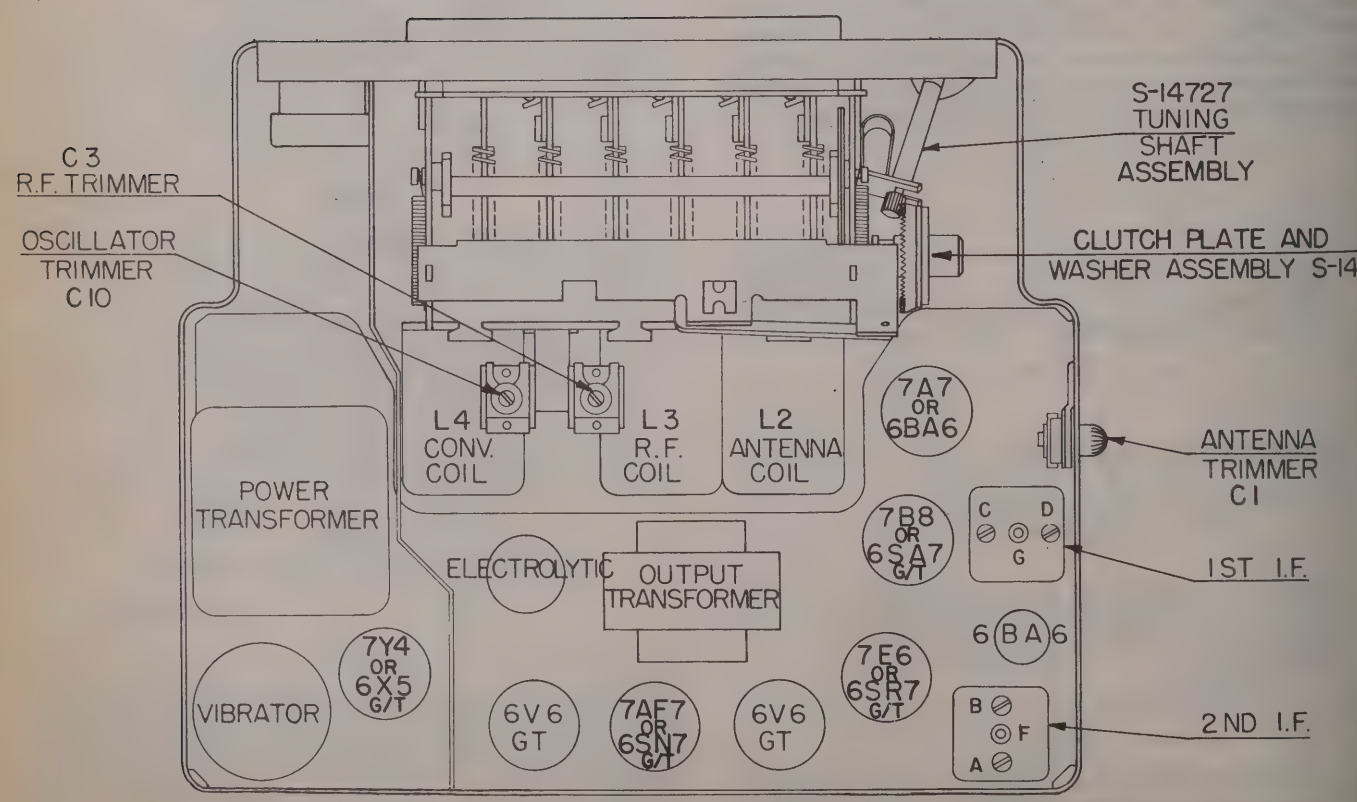


Fig. 8. Bottom View of Chassis

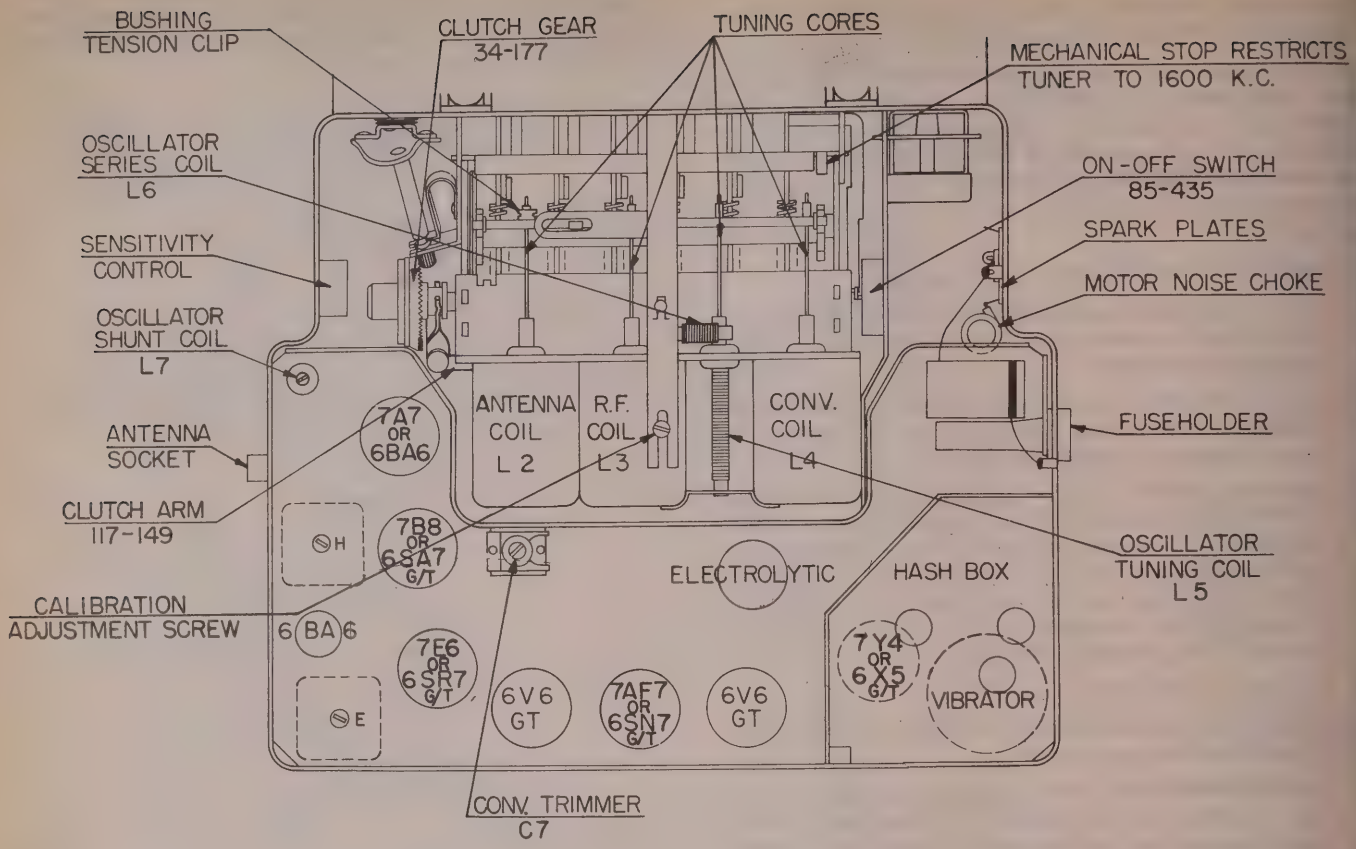


Fig. 7. Top View of Chassis

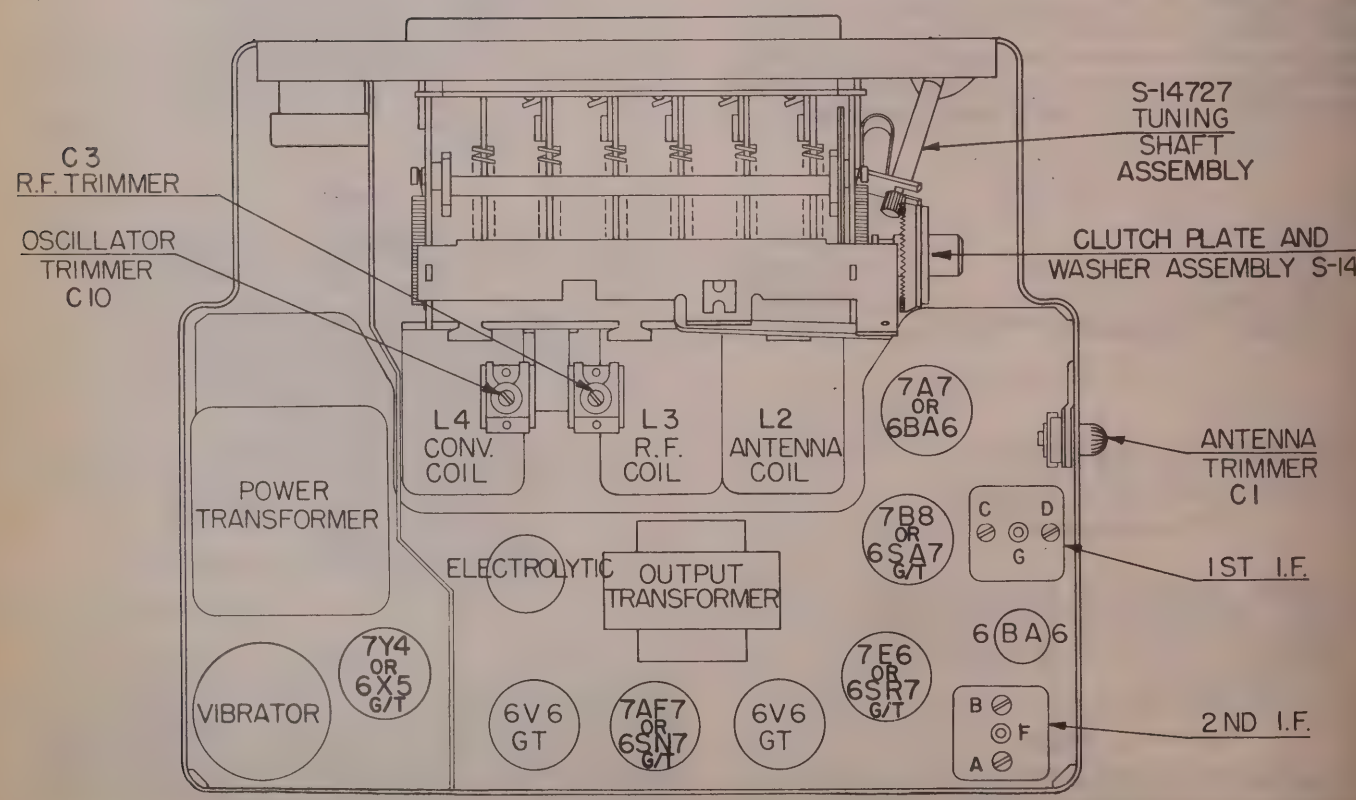


Fig. 8. Bottom View of Chassis

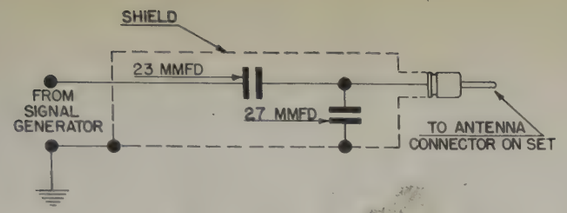


Fig. 9. Dummy Antenna

Figure 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output. (Fig. 8.) Some units have I.F. transformers that are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named. Repeat the operation to assure accurate alignment. (Figs. 7 and 8.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 8), for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-7, R.F., trimmer C3 and antenna trimmer C-1 (Fig. 8) for maximum response (Figs. 7 and 8).
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 7.)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

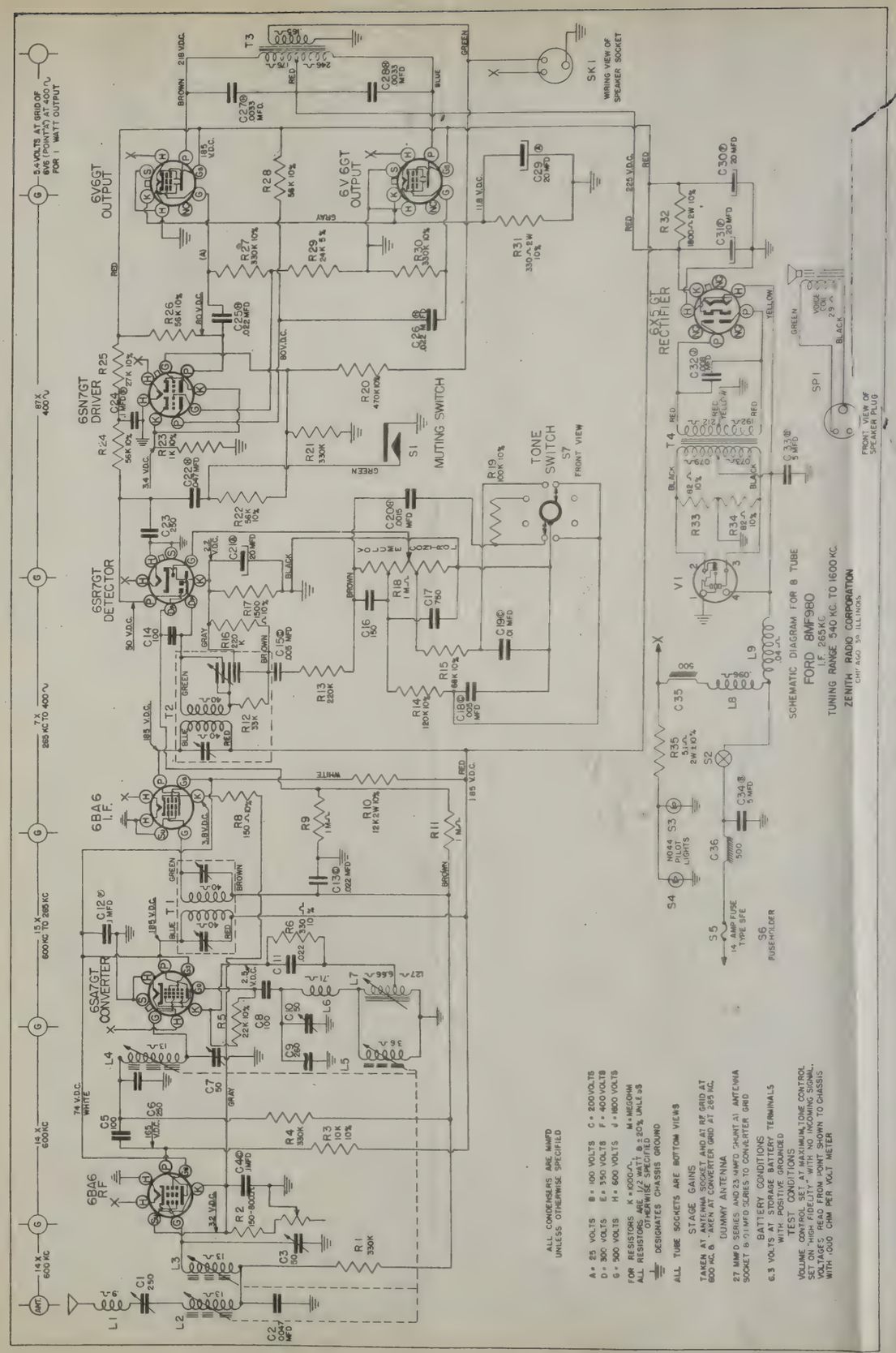
1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. With pliers remove the bushing tension clip from the cross arm insulating bushing.
3. With core alignment tool, part No. S-13064, screw the core in, or out, to the desired position.
4. After all adjustments or replacements are completed, be sure to replace the bushing tension clip.

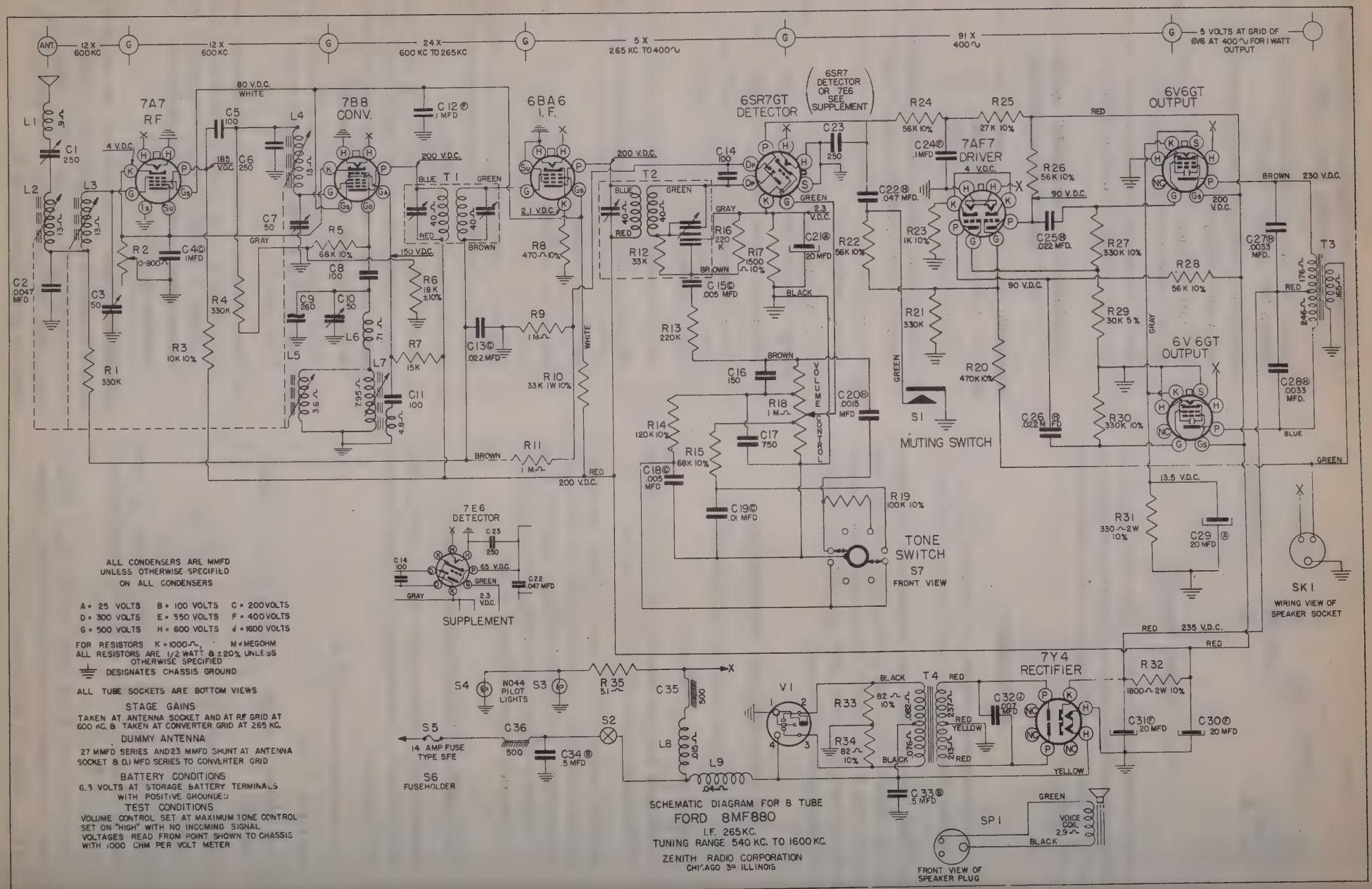
ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (Fig. 8) at 1675 Kc.
6. Adjust the converter trimmer C-7, R.F. trimmer C3, and antenna trimmer C-1 (Figs. 7 and 8) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about 1 1/16 of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (Fig. 7) to scale at 1300 Kc.
10. Adjust the antenna core L-2, R.F. core L3, and converter core L-4 (Fig. 7) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-7 (Fig. 7) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.





ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED
ON ALL CONDENSERS

A = 25 VOLTS B = 100 VOLTS C = 200 VOLTS
D = 300 VOLTS E = 350 VOLTS F = 400 VOLTS
G = 500 VOLTS H = 600 VOLTS J = 1600 VOLTS

FOR RESISTORS K = 1000~, M = MEGOHM
ALL RESISTORS ARE 1/2 WATT @ ±20% UNLESS OTHERWISE SPECIFIED

⏚ DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANTENNA SOCKET AND AT RF GRID AT 600 KC. & TAKEN AT CONVERTER GRID AT 265 KC.

DUMMY ANTENNA

27 MMFD SERIES AND 23 MMFD SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL. VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

SCHEMATIC DIAGRAM FOR 8 TUBE
FORD 8MF880
I.F. 265KC.
TUNING RANGE 540 KC. TO 1600 KC.

ZENITH RADIO CORPORATION
CHICAGO 39 ILLINOIS

PARTS LIST FORD AUTOMOTIVE RECEIVER

MODELS 8MF880 and 8MF980

Part No. 8A-18805-B

agram No.	Part No.	Description	Price
		COILS AND CHOKES	
9	20-213	Main Hash Choke	$ .36
1	95-1077	1st I.F. Transformer	1.85
2	95-1078	2nd I.F. Transformer	2.00
1	S-8819	Antenna Motor Noise Choke Assembly	.40
8	S-11232	Motor Noise Choke Assembly	.22
7	S-14225	Oscillator Shunt Coil Assembly	.80
6	S-14226	Oscillator Series Coil Assembly	.35
3	S-14227	RF Coil Assembly	.90
2	S-14227	Antenna Coil Assembly	.90
4	S-14227	Converter Coil Assembly	.90
5	S-14228	Oscillator Coil Assembly	.75
2, 3, 4, 5	S-14295	Tuner Coil Unit Assembly	6.25
		CONDENSERS	
12	22-170	.1 Mfd. 400 V.	.26
23	22-182	250 Mmfd. 400 V.	.26
4	22-190	.1 Mfd. 200 V.	.23
17	22-242	750 Mmfd. 500 V.	.26
15, 18	22-906	.005 Mfd. 200 V.	.20
6	22-1136	250 Mmfd. 500 V.	.20
16	22-1137	150 Mmfd. 500 V.	.20
34	22-1238	.5 Mfd. 120 V.	.50
19	22-1466	.01 Mfd. 200 V.	.20
29, 30, 31	22-1484	Electrolytic 20 Mfd.—25 V. x20-20 Mfd. 400 V.	2.10
21	22-1553	20 Mfd. Electrolytic 25 V.	.80
9	22-1712	260 Mmfd. Compensating	.50
32	22-1713	.007 Mfd. 1600 V.	1.00
7	22-1715	Single Section Trimmer (Converter)	.35
1	22-1721	Single Section Trimmer (Antenna)	.55
3, 10	22-1722	Two Section Trimmer (R.F. and Osc.)	.60
33	22-1728	.5 Mfd. 100 V.	.55
5, 11, 14	22-1730	100 Mmfd. Ceramic (or 22-162) 500 V.	.20
20	22-1743	.0015 Mfd. 600 V.	.20
27, 28	22-1747	.0033 Mfd. 600 V.	.26
24	22-1748	.1 Mfd. 400 V.	.26
22	22-1749	.047 Mfd. 600 V.	.35
25, 26	22-1750	.022 Mfd. 600 V.	.26
3	22-1751	.022 Mfd. 200 V.	.20
2	22-1752	.0047 Mfd. (or 22-1022) 600 V.	.26
		RESISTORS	
2	63-1379	Sensitivity Control	.56
0	63-1398	33M Ohm (Insulated) 1 W.	.24
7, 8	63-1590	Volume Control and Tone Switch	2.50
2	63-1620	1800 Ohm (Insulated) 2 W.	.36

Diagram No.	Part No.	Description	Price
R31	63-1622	330 Ohm (Insulated) 2 W.	$ .36
R33, R34	63-1740	82 Ohm (Insulated) ½ W.	.21
R 8	63-1771	470 Ohm (Insulated) ½ W.	.21
R23	63-1785	1000 Ohm (Insulated) ½ W.	.21
R17	63-1792	1500 Ohm (Insulated) ½ W.	.21
R 3	63-1827	10M Ohm (Insulated) ½ W.	.21
R 7	63-1835	15M Ohm (Insulated) ½ W.	.21
R25	63-1845	27M Ohm (Insulated) ½ W.	.21
R29	63-1846	30M Ohm (Insulated) ½ W.	.21
R12	63-1849	33M Ohm (Insulated) ½ W.	.21
R22, R24, R26, R28	63-1859	56M Ohm (Insulated) ½ W.	.21
R 5	63-1862	68M Ohm (Insulated) ½ W.	.21
R19	63-1869	100M Ohm (Insulated) ½ W.	.21
R14	63-1873	120M Ohm (Insulated) ½ W.	.21
R13, R16	63-1884	220M Ohm (Insulated) ½ W.	.21
R27, R30	62-1890	330M Ohm (Insulated) ½ W.	.21
R 1, R 4, R21	63-1891	330M Ohm (Insulated) ½ W.	.21
R20	63-1897	470M Ohm (Insulated) ½ W.	.21
R 9, R11	63-1912	1 Megohm (Insulated) ½ W.	.21
R 6	63-1838	18M Ohm ½ W.	.21
		MISCELLANEOUS	
	46-715	Antenna Trimmer Knob (used on 22-1721)	.07
SP 1	49-627	P.M. Speaker (6" x 9" Oval) (See S-14303)	7.75
S 6	52-451	Battery Cable—Fuse to Set—Fuse-holder	.35
	52-455	Volume Control Cable	.70
	52-470	Speaker Cable and Plug	.45
	73-50	No. 6-32 x ¼" Headless Slotted Set Screw—Cuppoint	.02
	78-596	Socket—Loktal Tube	.18
SK 1	78-728	Socket—Speaker	.20
	78-782	Socket—Miniature Tube	.25
	78-796	Socket—Antenna Connector	.20
	78-801	Socket—Octal Base Tube	.15
	78-804	Socket—Vibrator	.20
	93-888	Vibrator Cushion Washer	.04
T 4	95-1071	Power Transformer	7.50
T 3	95-1079	Output Transformer	4.00
	125-63	Rubber Grommet (used on S-14295)	.03
	126-553	Miniature Tube Shield	.11
	149-62	Iron Core and Screw	.10
	149-63	Iron Core and Spring (4 used)	.40
V 1	190-22	Vibrator	4.15
	196-91	Speaker Gasket and Screen	1.30
	199-81	Tone Gear Sleeve	.02
	202-575	Instruction Book (Owner's Manual)	.07
	202-605	Interference Elimination Instruction Sheet	.08

Diagram No.	Part No.	Description	Price
	S-14303	Speaker and Gasket Assembly (use 49-627 and 196-91)	
		INSTALLATION PARTS	
	S-14330	Installation Kit Assembly (complete)	$ .70
	52-458	Battery Cable—Fuse to Ammeter	.40
	54-157	¼-20 x 7/16" x 3/16" Hex Nut—Steel—Cad. Pl. (4 used)	.07
S 5	136-11	14 Ampere Fuse—Type S.F.E. No. 14	.12
	54-266	½-28 x 11/16" x ⅛" Hex Nut	.04
	54-189	No. 8-32 Wing Nut	.02
	93-161	¼" External Lockwasher	.01
	S-14335	Installation Bracket Assembly	.25
		MOTOR NOISE SUPPRESSION KIT	
	S-14331	Motor Noise Suppression Kit Assembly (complete)	3.10
	22-1110	Fuel Gauge Capacitor	.33
	22-1601	Generator Capacitor	1.20
	22-1767	Ignition Coil Capacitor	1.00
	63-1046	Distributor Suppressor	.31
	80-145	Motor Hood Bond Spring	.02
	112-365	No. 8 x ½" B.H. Sheet Metal Screw	.01
		DIAL ASSEMBLY	
	12-1437	Dial Scale Retaining Bracket	.08
	19-165	Insulating Bushing Tension Clip (4 used)	.03
	19-167	Window Retaining Clip (R.H.)	.03
	19-168	Window Retaining Clip (L.H.)	.03
	26-397	Dial Scale	.70
	46-711	Tone Control Knob	.55
	46-714	"Off" Switch Knob	.35
	56-228	Cross Arm Guide Rod	.15
	57-1357	Escutcheon	3.60
	59-210	Dial Pointer	.50
	80-232	Knob Retaining Spring	.02
	80-651	Pointer Retaining Spring	.03
	80-586	Cross Arm Tension Spring (2 used)	.07
	80-625	Pointer Link Tension Spring	.08
	83-1523	Light Diffusion Strip	.15
	94-607	Tuning Shaft Bushing	$ .20
	94-608	Volume Control Bushing	.20
	94-609	Cross Arm Insulating Bushing	.05

Diagram No.	Part No.	Description	Price
S 3, S 4	100-36	Dial Light Bulb—Mazda No. 44	$ .09
	112-699	No. 4-40 x 3/16" R.H. Self Tapping Screw—Stan Top—Steel—Cad	.01
	114-294	No. 6-20 x ¼" Hex Hd. Self Tapping Screw Type No. 25 (Escutcheon Mtg.)	.02
	192-116	Dial Window	.50
	S-14215	Pointer Support Bracket and Stud Assembly	.30
	S-14216	Pointer Drive Link and Stud Assembly	.15
	S-14300	Cross Arm and Bushing Assembly	1.00
	S-14659	Dial Light Socket and Wire Assembly	.30
	S-14660	Dial Light Socket and Wire Assembly	.30
	S-14307	Tone Gear and Bushing Assembly	.10
	S-14308	Tone Drum Shaft and Gear Assembly (26-390)	.50
	S-14333	Tuning Control and Knob Assembly	1.00
	S-14334	Volume Control Knob and Spring Assembly	.50
	S-14281	Tuner Unit Assembly	11.50
S 2	85-435	"On-Off" Switch (on Tuner)	.50
	S-14754	Automatic Knob and Screw Assembly	.50
	S-14721	Clutch Plate and Washer	.65
	S-14727	Tuning Shaft, Pinion Gear and Coupling Assembly	.50
	17-102	Cam Lock (5 used)	.03
	34-177	Clutch Gear	.70
	64-162	.088 D x 5/32" Rivet (2 used on S-14733)	.01
	73-118	No. 6-32 x ¼" Hex Hd. Slotted Set Screw (2 used)	.02
	80-640	Yoke Tension Spring (2 used)	.08
	80-641	Clutch Release Bar Spring	.01
	80-642	Clutch Spring	.02
	93-921	Tuning Shaft Steel Washer	.02
	93-922	Tuning Shaft Spring Washer	.02
	93-923	Fishpaper Washer (2 used)	.01
	97-305	Clutch Arm Stud	.03
	117-149	Clutch Lever	.15
	188-32	Retaining Ring	.01
S 1	S-14733	Mute Switch Assembly	.05

PARTS LIST MODEL 8MF980

The parts list for model 8MF980 is the same as for model 8MF880 with the following parts added and omitted:

ADD

Diag.No.	Part No.	Description	Price
C 1	22-1812	Antenna Trimmer	
C11	22-1751	.022Mfd Condenser	$ .20
C32	22-1448	Buffer Condenser	1.00
R 2	63-1662	Sensitivity Control	
R 5	63-1841	22K Ohm ½W.	.21
R 6	63-1764	330 Ohm ½ W.	.21
R 8	63-1750	150 Ohm ½ W.	.21
R10	63-1623	12K Ohm 2W.	.36
R29	63-1843	24K ½ W.	.21
L 7	S-14846	Oscillator Shunt Coil	
L 8	S-14761	Motor Noise Choke	
T 4	95-1073	Power Transformer	
	202-637	Instruction Book	.07
S-14836		Tone Drum Shaft & Gear Assembly	.50
26-409		Dial Scale	.70
63-1375		5.1 ohm W. W. resistor	.33

OMIT

Diag.No.	Part No.	Description	Price
C 1	22-1721	Antenna Trimmer	$ .55
C11	22-1730	100 Mmf Condenser	.20
C32	22-1713	Buffer Condenser	1.00
R 2	63-1379	Sensitivity Control	.56
R 5	63-1862	68K Ohm ½ W. Resistor	.21
R 6	63-1838	18K Ohm ½ W. Resistor	.21
R 7	63-1835	15K Ohm ½ W. Resistor	.21
R 8	63-1771	470 Ohm ½ W. Resistor	.21
R10	63-1398	33K Ohm 1 W. Resistor	.24
R29	63-1846	30K Ohm ½ W. Resistor	.21
L 7	S-14225	Oscillator Shunt Coil	.80
L 8	S-11232	Motor Noise Choke	.22
T 4	95-1071	Power Transformer	7.50
	202-575	Instruction Book	.07
S-14308		Tone Drum Shaft & Gear Assembly	.50
26-397		Dial Scale	.70

(Prices subject to change without notice)

SERVICE MANUAL

ZENITH
•LONG DISTANCE• AUTO RADIO

Model
8MF881

Ford Truck Part No.
8C-18805-B

Made by ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, U.S.A.

Electrical Specifications

TUNING RANGE: ..... 540-1600 Kc.

INTERMEDIATE FREQUENCY: ..... 265 Kc.

SENSITIVITY: ..... 5 microvolts at one watt output.

UNDISTORTED POWER OUTPUT: .....
6 watts measured at the voice coil.

SPEAKER: ..... 6″ x 9″ oval, instrument panel mounting.

CURRENT CONSUMPTION: ..... 8 amperes

TUBE COMPLEMENT: ..... 7A7 R.F., 7B8 converter, 6BA6 I.F., 7E6 or 6SR7GT detector and 1st audio, 7AF7 driver and phase-inverter, 2-6V6GT push pull power output, and 7Y4 rectifier.

IMPORTANT

The Warranty Registration Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

Printed in U.S.A.—5M—4-48—C. P.

Form FT-48

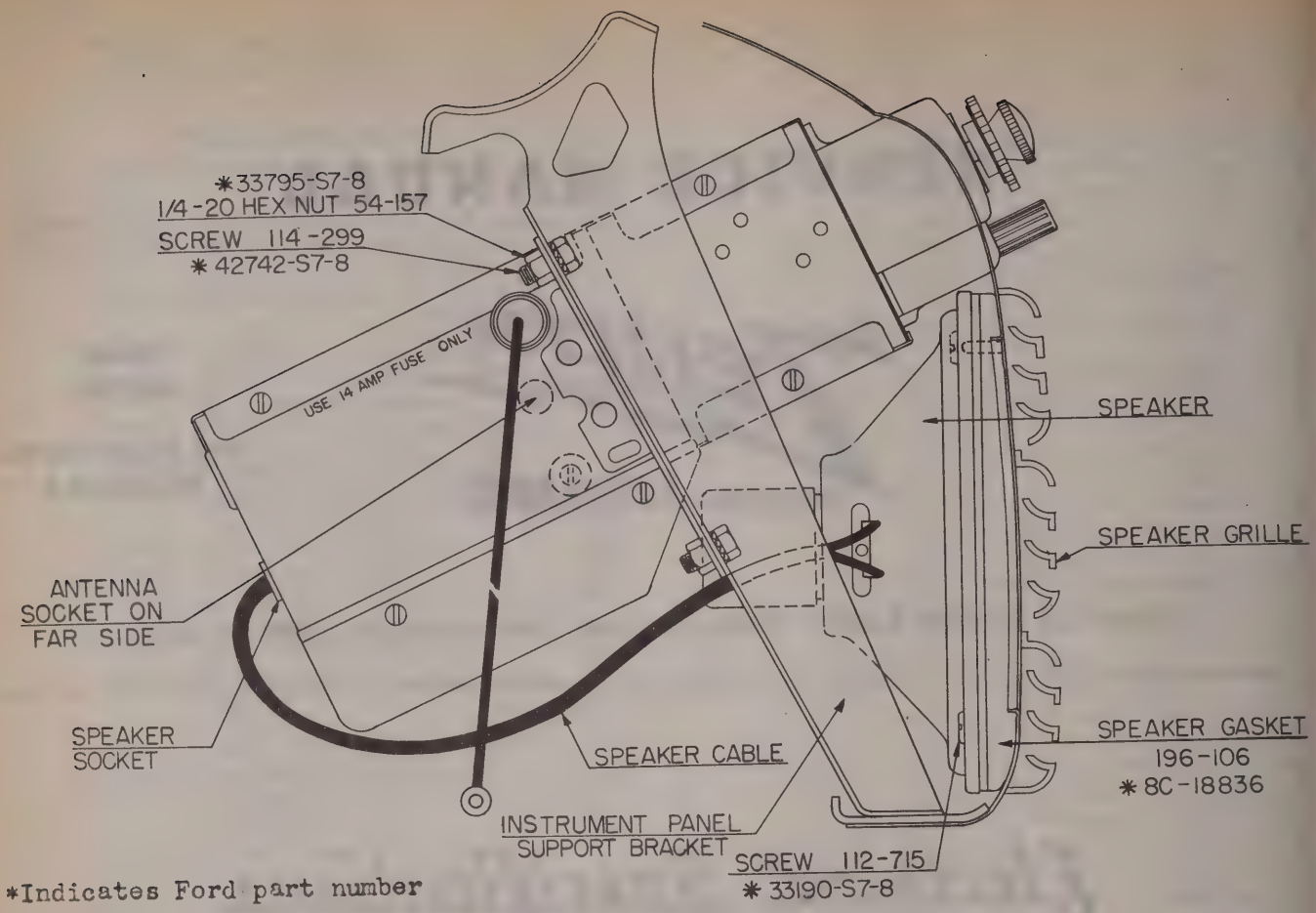


Fig. 1. Set Installed, Cut Away View

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the escutcheon plate, control knobs and the installed receiver, are given here to facilitate removal and reinstallation of the receiver when service or repair is necessary.

1. Disconnect the "A" lead, the speaker cable, and the antenna from the receiver. (Fig. 1.)
2. Remove the four ¼" screws No. 114-299, and take the set from its position behind the instrument panel. (Fig. 1.)
3. To take the speaker from behind the instrument panel remove the two screws No. 112-715. (Fig. 1.)

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push buttons. (Fig. 2.) Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push button (Fig. 2.)

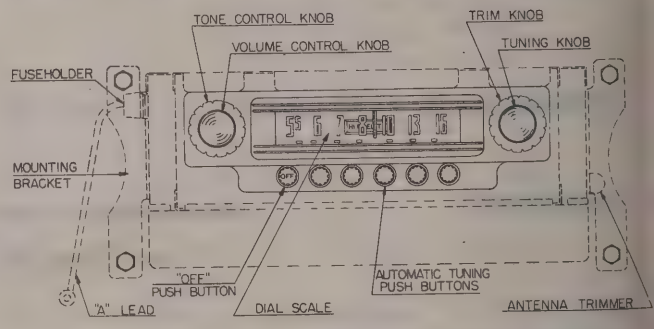


Fig. 2. Front Panel View

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Fig. 2.) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Fig. 2.)

TONE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

AUTOMATIC TUNING:

There are five automatic tuning push buttons located to the right of the "Off" push button. (Fig. 2.)

The five buttons may be adjusted in succession to any desired dial setting. To simplify the identification of the stations, it is advisable to set the buttons in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

To adjust the automatic tuning push buttons:

1. Turn the receiver on and allow it to operate for at least 15 minutes in order for each part to reach normal operating temperature.
2. Tune in the station desired for number 1 position by turning the tuning knob. (Fig. 2.) Be sure to tune to the exact frequency to insure the best tone.
3. Loosen the number one push button, located nearest the "OFF" push button (Fig. 2) by turning it counterclockwise with your fingers not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may fall apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.
4. Press the button in as far as it will go.
5. Release the number 1 button and tighten it by turning it clockwise with your fingers.
6. Use the same procedure for adjusting positions 2, 3, 4, and 5. When the five automatic tuning push buttons have been adjusted to the five desired stations, any one of the five stations can be instantly tuned in by pressing the automatic push button that is adjusted to it.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

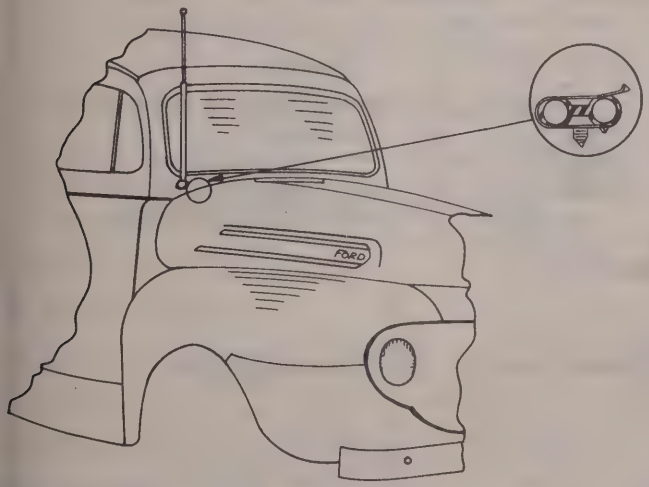

REMOVE SCREW FROM HOOD PAD
ON COWL AT LOCATION SHOWN AND
INSTALL HOOD BONDING SPRING 80-579 *51A-18870
WITH SCREW 112-365 *32923-S7-8

Fig. 3

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 3.

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 4.)

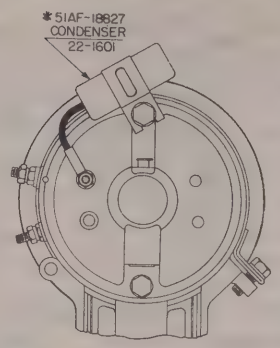


Fig. 4

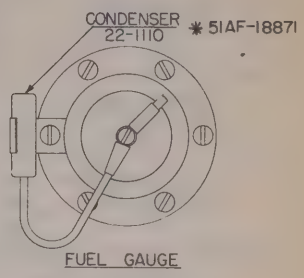


Fig. 5

A condenser, Part No. 22-1110, should be connected to the fuel gauge tank unit. (Fig. 5.)

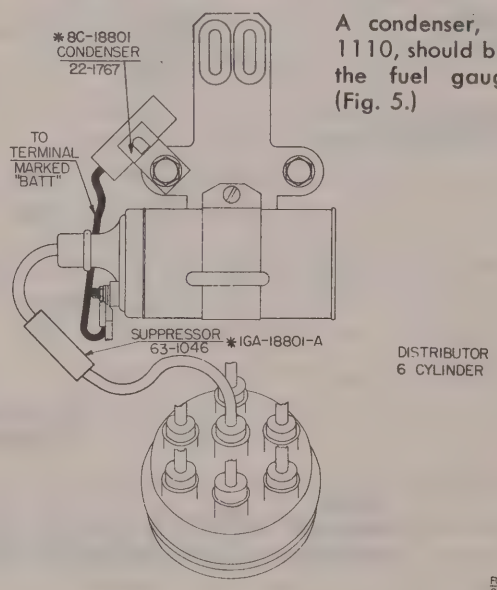


Fig. 6

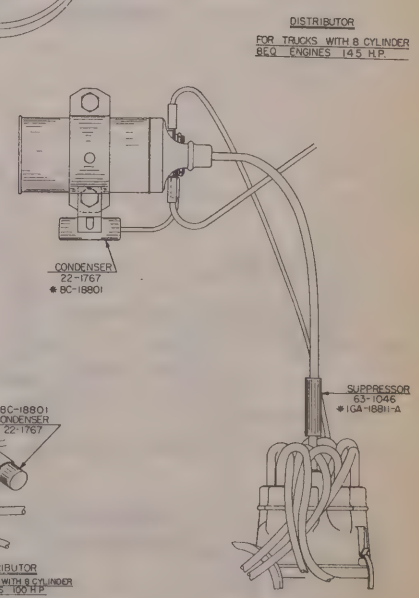


Fig. 6A Fig. 6B

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1½ inches from the distributor cap. (Figs. 6, 6A and 6B.) The ignition coil condenser, No. 22-1767, should be connected to the BAT. terminal of the ignition coil. (Figs. 6, 6A and 6B.)

*Indicates Ford part number

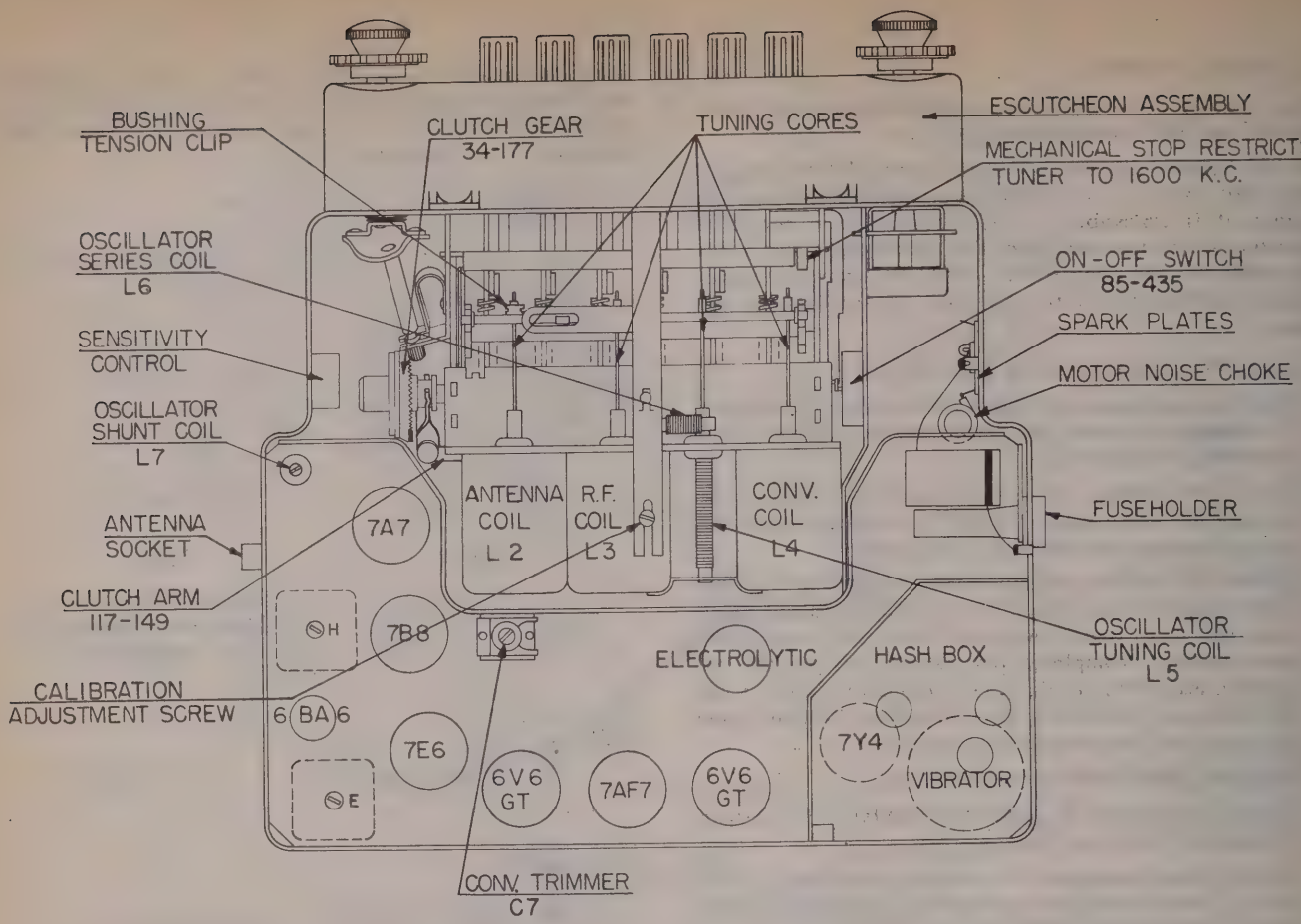


Fig. 7. Top View of Chassis

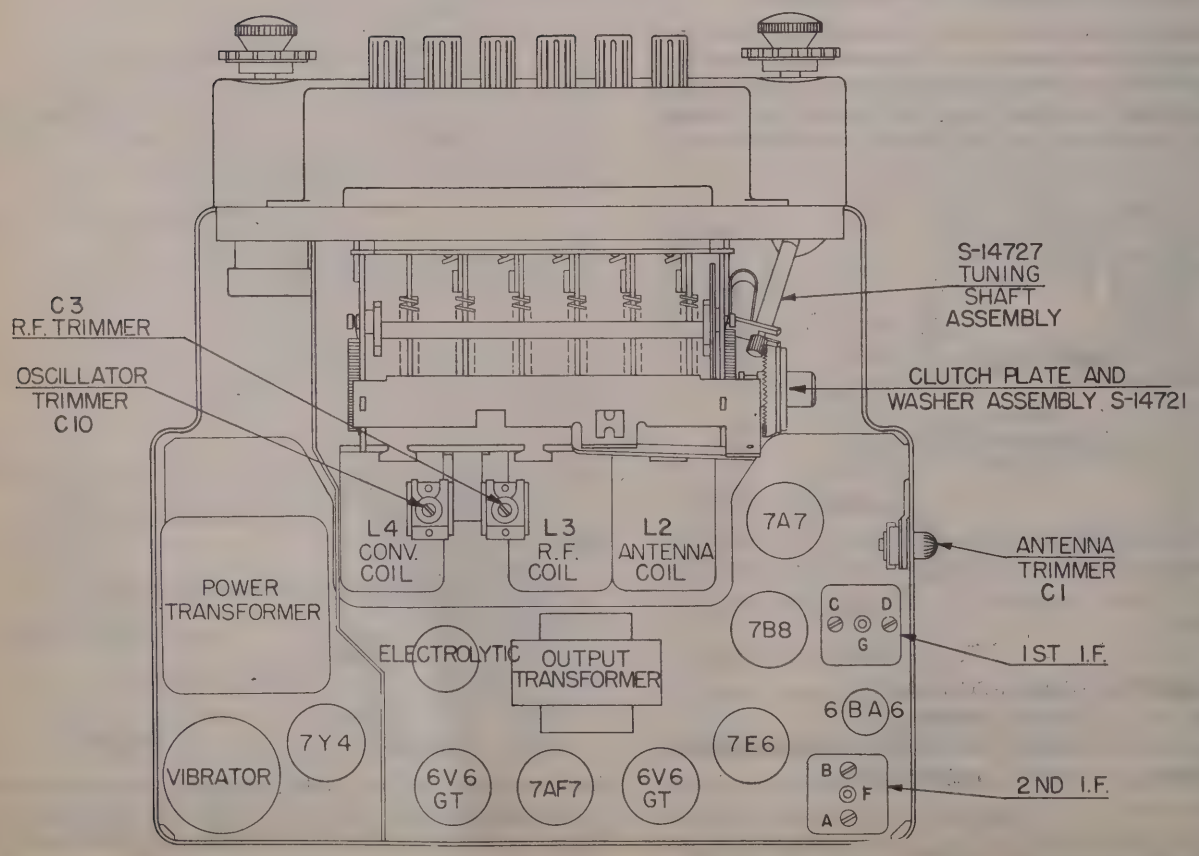


Fig. 8. Bottom View of Chassis

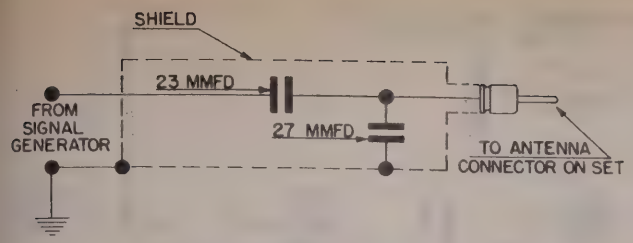


Fig. 9. Dummy Antenna

Figure 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output. (Fig. 8.) Some units have I.F. transformers that are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named. Repeat the operation to assure accurate alignment. (Figs. 7 and 8.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 8), for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C3 and antenna trimmer C-1 (Fig. 8) for maximum response (Figs. 7 and 8).
8. If dial calibration is off after making above adjustments, a correction can be made by turning eccentric screw at fulcrum of dial pointer. (Fig. 7.)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

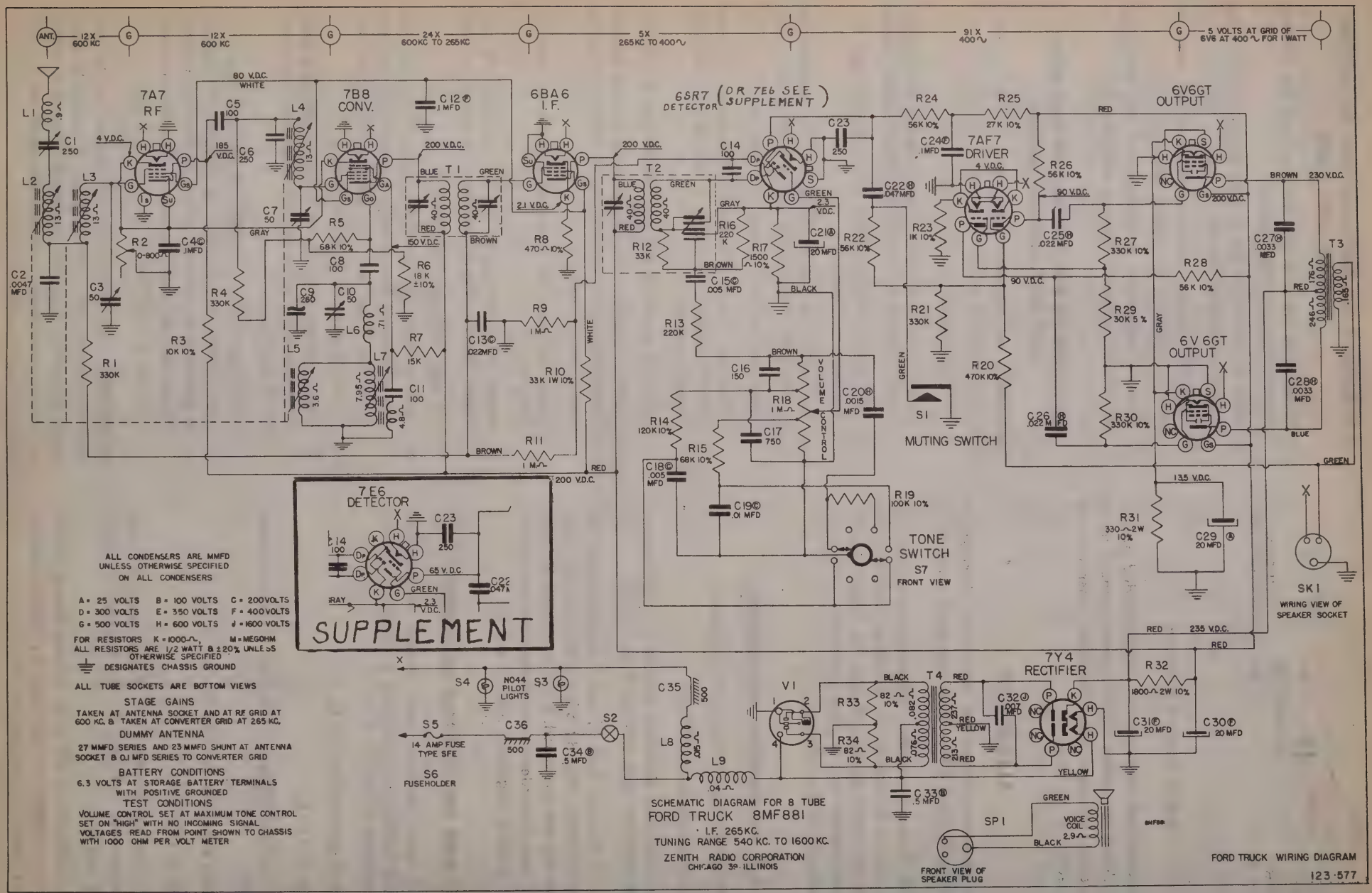
1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. With pliers remove the bushing tension clip from the cross arm insulating bushing.
3. With core alignment tool, part No. S-13064, screw the core in, or out, to the desired position.
4. After all adjustments or replacements are completed, be sure to replace the bushing tension clip.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (Fig. 8) at 1675 Kc.
6. Adjust the converter trimmer C-7, R.F. trimmer C3, and antenna trimmer C-1 (Figs. 7 and 8) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about $1\frac{1}{16}$ of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (Fig. 7) to scale at 1300 Kc.
10. Adjust the antenna core L-2, R.F. core L3, and converter core L-4 (Fig. 7) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-7 (Fig. 7) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.


ANT.
12 X 600 KC
12 X 600 KC
24 X 600KC TO 265KC
5X 265KC TO 400
91 X 400
5 VOLTS AT GRID OF 6V6 AT 400 FOR 1 WATT
7A7 RF
7B8 CONV.
6BA6 I.F.
6SR7 (OR 7E6 SEE SUPPLEMENT) DETECTOR
7AF7 DRIVER
6V6GT OUTPUT
6V6GT OUTPUT
7Y4 RECTIFIER
7E6 DETECTOR
SUPPLEMENT
MUTING SWITCH
TONE SWITCH S7 FRONT VIEW
VOLUME CONTROL
SK1 WIRING VIEW OF SPEAKER SOCKET
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED ON ALL CONDENSERS
A = 25 VOLTS B = 100 VOLTS C = 200 VOLTS
D = 300 VOLTS E = 350 VOLTS F = 400 VOLTS
G = 500 VOLTS H = 600 VOLTS J = 1600 VOLTS
FOR RESISTORS K = 1000 M = MEGOHM
ALL RESISTORS ARE 1/2 WATT ± 20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT RF GRID AT 600 KC. & TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
27 MMFD SERIES AND 23 MMFD SHUNT AT ANTENNA SOCKET & .01 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
SCHEMATIC DIAGRAM FOR 8 TUBE FORD TRUCK 8MF881
I.F. 265KC.
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION CHICAGO 39 ILLINOIS
FRONT VIEW OF SPEAKER PLUG
FORD TRUCK WIRING DIAGRAM
123-577

SCHEMATIC

PARTS LIST FORD TRUCK RECEIVER

MODEL 8MF881

COILS AND CHOKES

Diagram No.	Part No.	Description	Price
L 9	20-213	Main Hash Choke	$ .36
T 1	95-1077	1st I.F. Transformer	1.85
T 2	95-1078	2nd I.F. Transformer	2.00
L 1	S-8819	Antenna Motor Noise Choke Assembly	.40
L 8	S-11232	Motor Noise Choke Assembly	.22
L 7	S-14225	Oscillator Shunt Coil Assembly	.80
L 6	S-14226	Oscillator Series Coil Assembly	.35
L 3	S-14227	RF Coil Assembly	.90
L 2	S-14227	Antenna Coil Assembly	.90
L 4	S-14227	Converter Coil Assembly	.90
L 5	S-14228	Oscillator Coil Assembly	.75
L 2, L 3, L 4, L 5	S-14295	Tuner Coil Unit Assembly	6.25

CONDENSERS

C12	22-170	.1 Mfd	400 V.	.26
C23	22-182	250 Mmfd	400 V.	.26
C 4	22-190	.1 Mfd	200 V.	.23
C17	22-242	750 Mmfd	500 V.	.26
C15, C18	22-906	.005 Mfd	200 V.	.20
C 6	22-1136	250 Mmfd	500 V.	.20
C16	22-1137	150 Mmfd	500 V.	.20
C34	22-1238	.5 Mfd	120 V.	.50
C19	22-1466	.01 Mfd	200 V.	.20
C29, C30, C31	22-1484	Electrolytic 20 Mfd.—25 V. x20-20 Mfd	400 V.	2.10
C21	22-1553	20 Mfd. Electrolytic	25 V.	.80
C 9	22-1712	260 Mmfd. Compensating		.50
C32	22-1713	.007 Mfd	1600 V.	1.00
C 7	22-1715	Single Section Trimmer (Converter)		.35
C 1	22-1721	Single Section Trimmer (Antenna)		.55
C 3, C10	22-1722	Two Section Trimmer (R.F. and Osc.)		.60
C33	22-1728	.5 Mfd	100 V.	.55
C 5, C11, C14	22-1730	100 Mmfd. Ceramic (or 22-162)	500 V.	.20
C20	22-1743	.0015 Mfd	600 V.	.20
C27, C28	22-1747	.0033 Mfd	600 V.	.26
C24	22-1748	.1 Mfd	400 V.	.26
C22	22-1749	.047 Mfd	600 V.	.35
C25, C26	22-1750	.022 Mfd	600 V.	.26
C13	22-1751	.022 Mfd	200 V.	.20
C 2	22-1752	.0047 Mfd. (or 22-1022)	600 V.	.26

RESISTORS

Diagram No.	Part No.	Description	Price
R 2	63-1379	Sensitivity Control	$ .56
R10	63-1398	33M Ohm (Insulated) 1 W.	.24
S 7, R18	63-1590	Volume Control and Tone Switch	2.50
R32	63-1620	1800 Ohm (Insulated) 2 W.	.36
R31	63-1622	330 Ohm (Insulated) 2 W.	.36
R33, R34	63-1740	82 Ohm (Insulated) ½ W.	.21
R 8	63-1771	470 Ohm (Insulated) ½ W.	.21
R23	63-1785	1000 Ohm (Insulated) ½ W.	.21
R17	63-1792	1500 Ohm (Insulated) ½ W.	.21
R 3	63-1827	10M Ohm (Insulated) ½ W.	.21
R 7	63-1835	15M Ohm (Insulated) ½ W.	.21
R25	63-1845	27M Ohm (Insulated) ½ W.	.21
R29	63-1846	30M Ohm (Insulated) ½ W.	.21
R12	63-1849	33M Ohm (Insulated) ½ W.	.21
R22, R24, R26, R28	63-1859	56M Ohm (Insulated) ½ W.	.21
R 5	63-1862	68M Ohm (Insulated) ½ W.	.21
R19	63-1869	100M Ohm (Insulated) ½ W.	.21
R14	63-1873	120M Ohm (Insulated) ½ W.	.21
R13, R16	63-1884	220M Ohm (Insulated) ½ W.	.21
R27, R30	63-1890	330M Ohm (Insulated) ½ W.	.21
R 1, R 4, R21	63-1891	330M Ohm (Insulated) ½ W.	.21
R20	63-1897	470M Ohm (Insulated) ½ W.	.21
R 9, R11	63-1912	1 Megohm (Insulated) ½ W.	.21
R 6	63-1838	18M Ohm ½ W.	.21

MISCELLANEOUS

	12-1423	Set Mounting Bracket	.15
	12-1424	Set Mounting Bracket	.15
	46-715	Antenna Trimmer Knob (used on 22-1721)	.07
SP 1	49-627	P.M. Speaker (6" x 9" Oval) (See S-14344.	7.75
S 6	52-451	Battery Cable—Fuse to Set—Fuse-holder	.35
	52-455	Volume Control Cable	.70
	52-470	Speaker Cable and Plug	.45
	73-50	No. 6-32 x ¼" Headless Slotted Set Screw—Cuppoint	.02
	78-596	Socket—Loktal Tube	.18
SK 1	78-728	Socket—Speaker	.20
	78-782	Socket—Miniature Tube	.25
	78-796	Socket—Antenna Connector	.20
	78-801	Socket—Octal Base Tube	.15

Diagram No.	Part No.	Description	Price
	78-804	Socket—Vibrator	$ .20
	93-888	Vibrator Cushion Washer	.04
	93-891	Tone Control Knob Washer	.01
T 4	95-1071	Power Transformer	7.50
T 3	95-1079	Output Transformer	4.00
	125-63	Rubber Grommet (used on S-14295)	.03
	126-553	Miniature Tube Shield	.11
	149-62	Iron Core and Screw	.10
	149-63	Iron Core and Spring (4 used)	.40
V 1	190-22	Vibrator	4.15
	196-106	Speaker Gasket	1.30
	199-81	Tone Gear Sleeve	.02
	202-577	Instruction Book (Owner's Manual)	.07
	202-606	Interference Elimination Instruction Sheet	.08
	S-14344	Speaker and Gasket Assembly (use 49-627 and 196-106)	

INSTALLATION PARTS

	S-14339	Installation Kit Assembly (complete)	.70
	52-458	Battery Cable—Fuse to Ammeter	.40
	54-157	1/4-20 x 7/16" x 3/16" Hex Nut—Steel—Cad. Pl. (4 used)	.07
	112-715	No. 8 x 5/8" Binding Hd. Self Tapping Screw	.013
	114-299	1/4-20 x 1/2" Hex. Hd. M. Screw—Steel—Cad. Pl.	.04
S 5	136-11	14 Ampere Fuse—Type S.F.E. No. 14	.12

MOTOR NOISE SUPPRESSION KIT

	S-14340	Motor Noise Suppression Kit Assembly (complete)	3.10
	22-1110	Fuel Gauge Capacitor	.33
	22-1601	Generator Capacitor	1.20
	22-1767	Ignition Coil Capacitor	1.00
	63-1046	Distributor Suppressor	.31
	80-579	Motor Hood Bond Spring	.09
	112-365	No. 8 x 1/2" B.H. Sheet Metal Screw	.01

DIAL ASSEMBLY

	12-1435	Dial Scale Retaining Bracket (2 used)	.01
	19-165	Insulating Bushing Tension Clip (4 used)	.03
	26-395	Dial Scale	3.00
	46-727	Tone Control Knob	.20
	46-714	"Off" Switch Knob	.35

Diagram No.	Part No.	Description	Price
	56-228	Cross Arm Guide Rod	$ .15
	57-1349	Escutcheon	3.00
	57-1344	Dial Background Plate	.50
	59-208	Dial Pointer	.40
	80-232	Knob Retaining Spring	.02
	80-379	Pointer Retaining Spring	.03
	80-586	Cross Arm Tension Spring (2 used)	.07
	80-625	Pointer Link Tension Spring	.08
	94-609	Cross Arm Insulating Bushing	.05
S 3 S 4	100-36	Dial Light Bulb—Mazda No. 44	.09
	112-699	No. 4-40 x 3/16" R.H. Self Tapping Screw—Stan Top—Steel—Cad	.01
	114-294	No. 6-20 x 1/4" Hex Hd. Self Tapping Screw Type No. 25 (Escutcheon Mtg.)	.02
	S-14215	Pointer Support Bracket and Stud Assembly	.30
	S-14216	Pointer Drive Link and Stud Assembly	.15
	S-14300	Cross Arm and Bushing Assembly	1.00
	S-14304	Dial Light Socket and Wire Assembly	.35
	S-14307	Tone Gear and Bushing Assembly	.10
	S-14308	Tone Drum Shaft and Gear Assembly (26-390)	.50
	S-14342	Tuning Control and Knob Assembly	.75
	S-14343	Volume Control Knob and Spring Assembly	.40
	S-14386	Tuner Unit Assembly	12.50
S 1	S-14534	Tuner Unit Final Assembly	
S 2	85-435	"On-Off" Switch (on Tuner)	.50
	S-14754	Automatic Knob and Screw Assembly	.50
	S-14721	Clutch Plate and Washer	.65
	S-14729	Tuning Shaft, Pinion Gear and Coupling Assembly	.50
	17-102	Cam Lock (5 used)	.03
	34-177	Clutch Gear	.70
	64-162	.088 D x 5/32" Rivet (2 used on S-14733)	.01
	73-118	No. 6-32 x 1/4" Hex Hd. Slotted Set Screw (2 used)	.02
	80-640	Yoke Tension Spring (2 used)	.08
	80-641	Clutch Release Bar Spring	.01
	80-642	Clutch Spring	.02
	93-921	Tuning Shaft Steel Washer	.02
	93-922	Tuning Shaft Spring Washer	.02
	93-923	Fishpaper Washer (2 used)	.01
	97-305	Clutch Arm Stud	.03
	117-149	Clutch Lever	.15
	188-111	Retaining Ring (2 used)	.02

(Prices subject to change without notice)

SERVICE MANUAL

Model
8ML882

Lincoln Part No.
8L-18805-A

ZENITH
LONG DISTANCE AUTO RADIO

Model
8ML882Z

Lincoln Part No.
8H-18805-A

Made by ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, U.S.A.

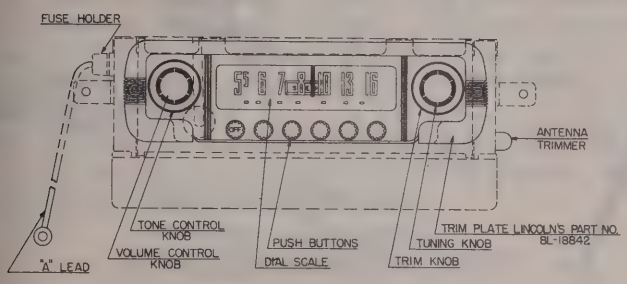


Fig. 1. 8ML882

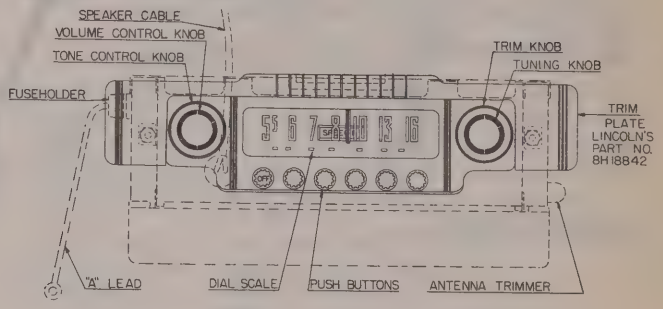


Fig. 1A. 8ML882Z

Electrical Specifications

TUNING RANGE: . . . . . 540-1600 Kc.

INTERMEDIATE FREQUENCY: . . . . . 265 Kc.

SENSITIVITY: . . . . . 5 microvolts at one watt output.

UNDISTORTED POWER OUTPUT: . . . . . 6 watts measured at the voice coil.

SPEAKER: . . . . . 6″ x 9″ oval, instrument panel mounting.

CURRENT CONSUMPTION: . . . . . 8 amperes

TUBE COMPLEMENT: . . . . . 7A7 R.F., 7B8 converter, 6BA6 I.F., 7E6 detector and 1st audio, 7AF7 driver and phase-inverter, 2-6V6GT push pull power output, and 7Y4 rectifier.

IMPORTANT

The Warranty Registration Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

Printed in U.S.A.—5M—3-48—C. P.

Form L-48

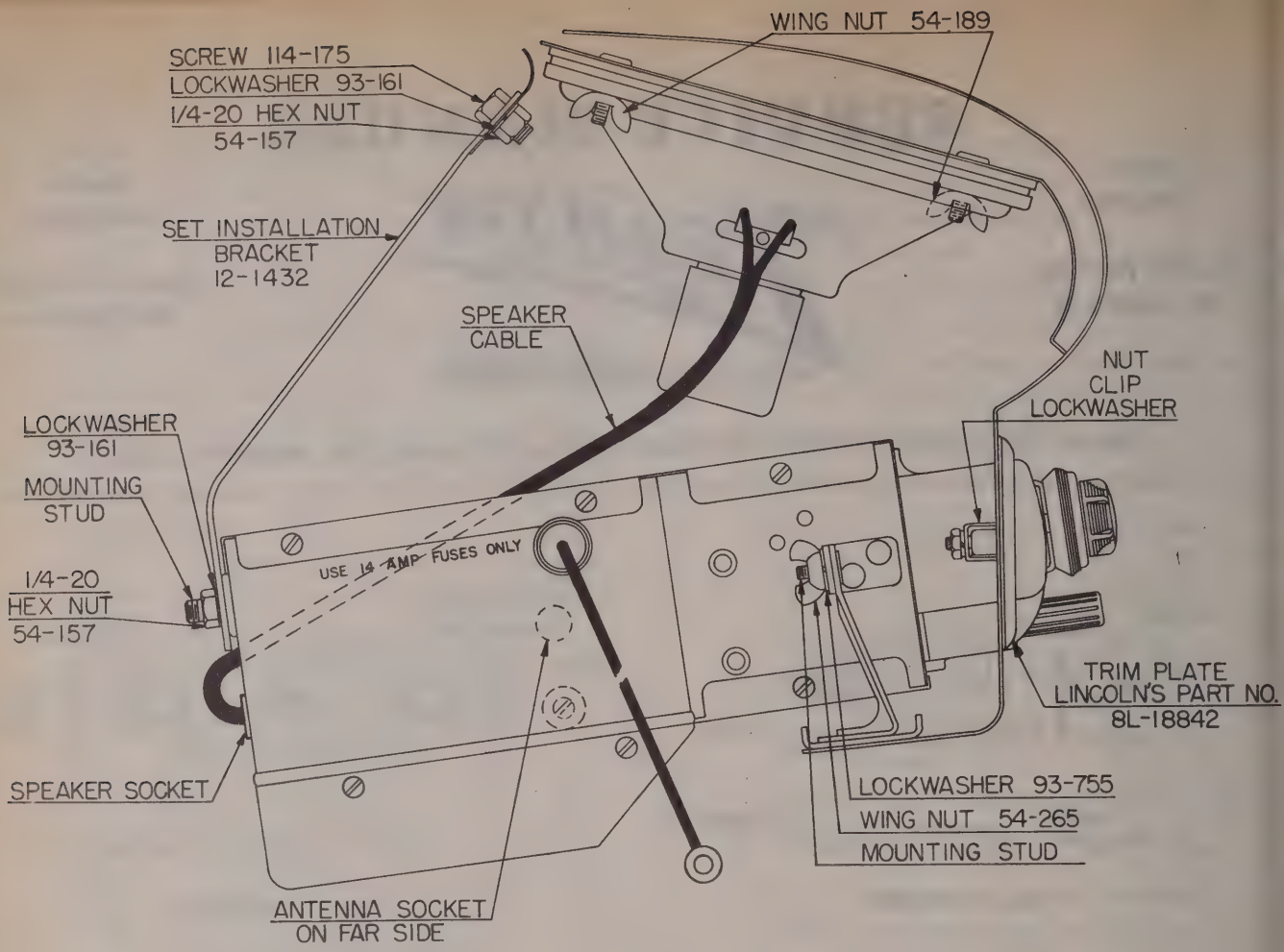


Fig. 2. Model 8ML882

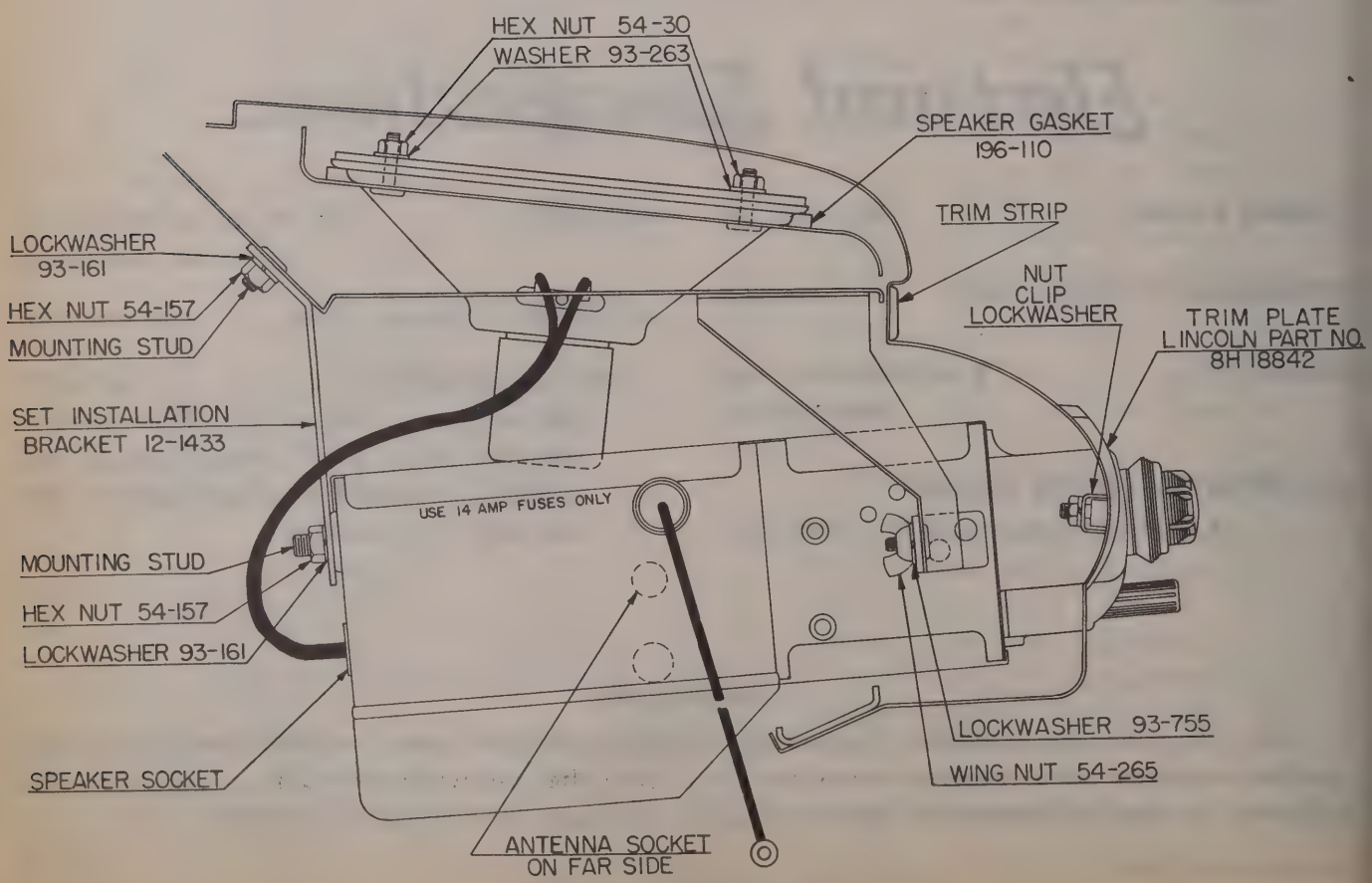


Fig. 2A. Model 8ML882Z

RECEIVER INSTALLATIONS

Figures 1, 1A, 2 and 2A, illustrating the escutcheon plates, control knobs and the installed receivers, are given here to facilitate removal and reinstallation of the receivers when service or repair is necessary.

To take the receiver from the car:

1. Remove the plenem chamber of the heater (Model 8L Lincoln only), by removing the two sheet metal screws at each end of the chamber.
2. Disconnect the "A" lead at the set. Remove the speaker plug from the set and disconnect the antenna.
3. Loosen the top of the set installation bracket, and remove the bottom of the bracket from the set. (Figs. 2-2A.)
4. Remove the 8/32 wingnuts and lockwashers from the instrument panel support brackets. (Figs. 2-2A.)

To take the speaker from the Model 8H Lincoln, pry off the trim strip along the bottom edge of the speaker grille. Remove the three sheet metal screws from the lower edge of the speaker grille, and remove the grille. Remove the two 8/32 hex nuts and flat washers holding the speaker in place. (Fig. 2A.)

To take the speaker from the Model 8L Lincoln, remove the two stamped wingnuts from the stud bolts on the rear of the instrument panel. (Fig. 2.)

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push buttons. (Figs. 1, 1-A.) Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push button. (Fig. 1.)

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Figs. 1, 1A.) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Figs. 1, 1A.)

TONE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

AUTOMATIC TUNING:

There are five automatic tuning push buttons located to the right of the "Off" push button. (Figs. 1, 1A.)

The five buttons may be adjusted in succession to any desired dial setting. To simplify the identification of the stations, it is advisable to set the buttons in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

To adjust the automatic tuning push buttons:

1. Turn the receiver on and allow it to operate for at least 15 minutes in order for each part to reach normal operating temperature.
2. Tune in the station desired for number 1 position by turning the tuning knob. (Fig. 1.) Be sure to tune to the exact frequency to insure the best tone.
3. Loosen the number one push button, located nearest the "OFF" push button (Fig.), by turning it counterclockwise with your fingers not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may fall apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.
4. Press the button in as far as it will go.
5. Release the number 1 button and tighten it by turning it clockwise with your fingers.
6. Use the same procedure for adjusting positions 2, 3, 4, and 5. When the five automatic tuning push buttons have been adjusted to the five desired stations, any one of the five stations can be instantly tuned in by pressing the automatic push button that is adjusted to it.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 3.

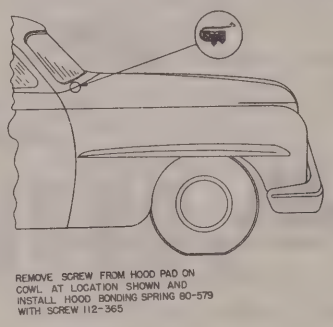


Fig. 3

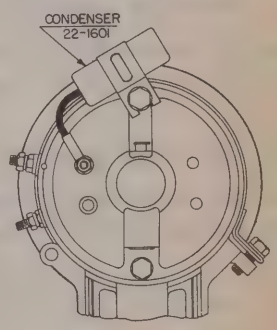


Fig. 4

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 4.)

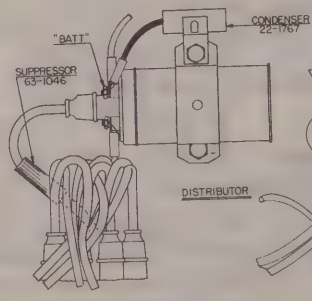


Fig. 5

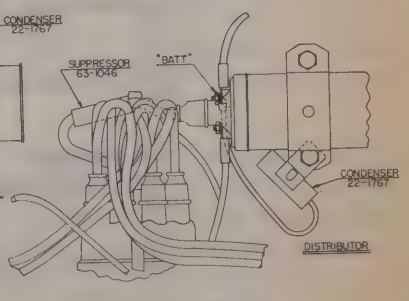


Fig. 6

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1½ inches from the distributor cap. (Figs. 5 and 6.) The ignition coil condenser, No. 22-1767, should be connected to the BAT. terminal of the ignition coil. (Figs. 5 and 6.)

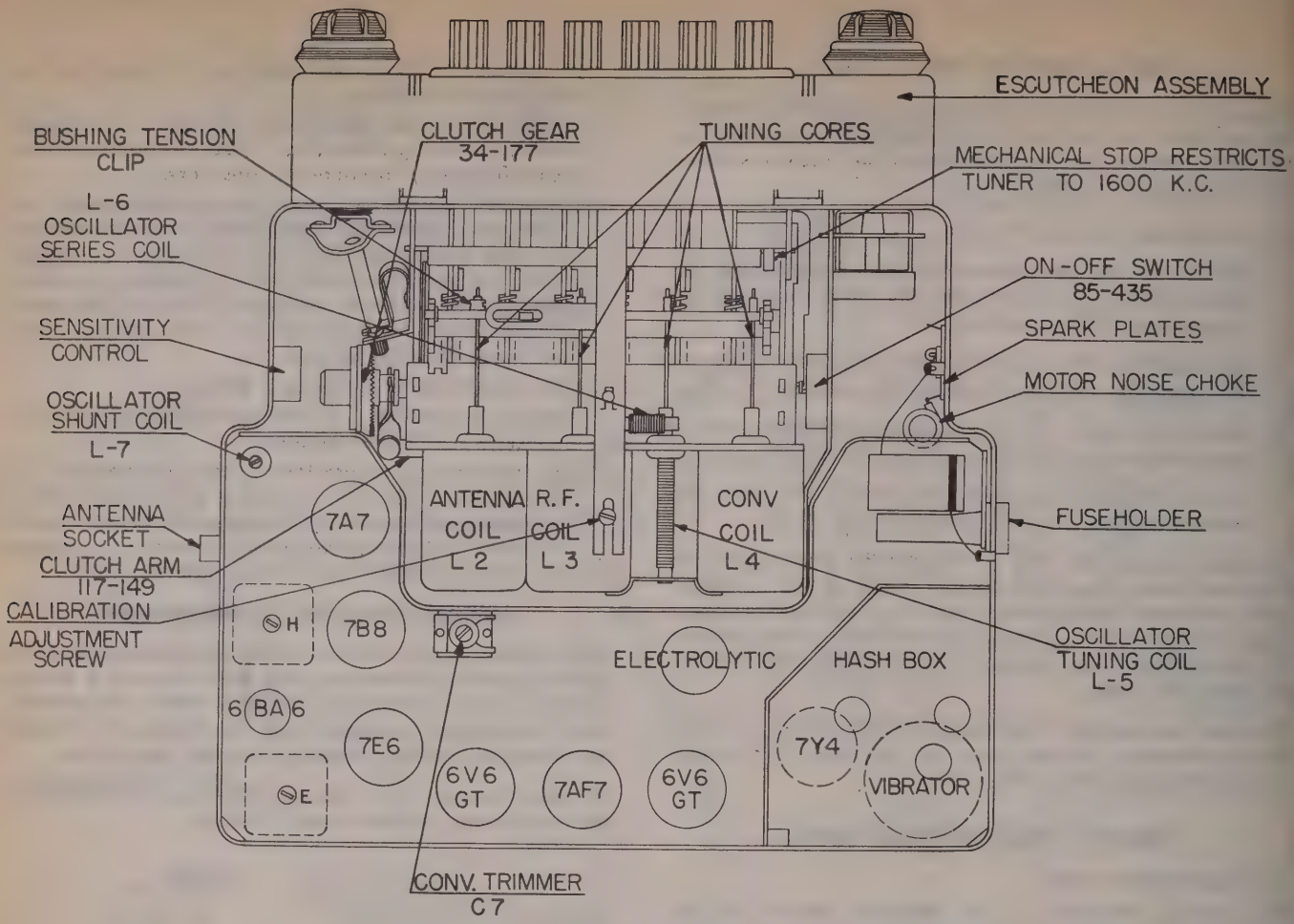


Fig. 7. Top View of Chassis

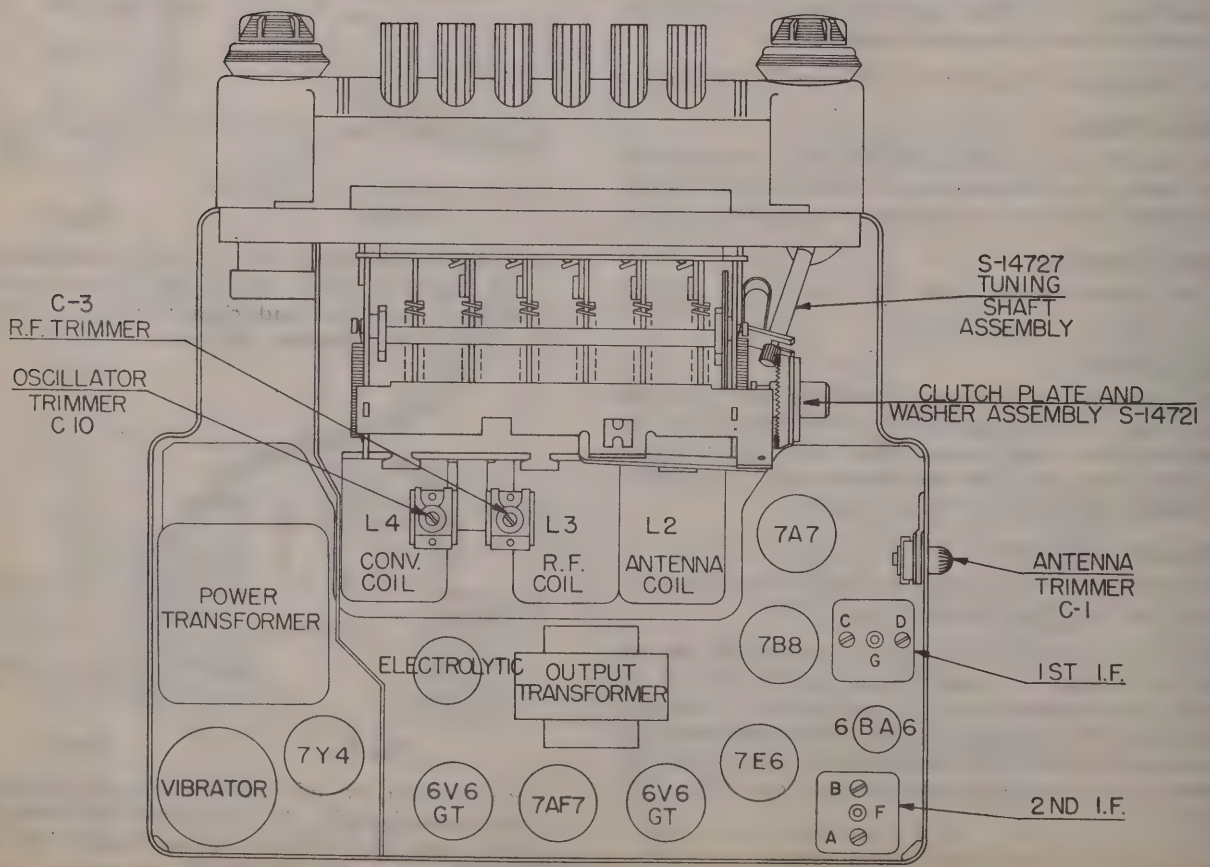


Fig. 8. Bottom View of Chassis

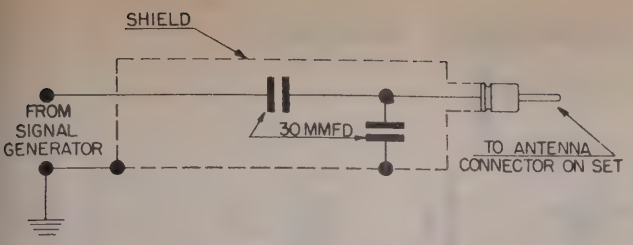


Fig. 9. Dummy Antenna

Figure 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output. (Fig. 8.) Some units have I.F. transformers that are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named. Repeat the operation to assure accurate alignment. (Figs. 7 and 8.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 8), for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C3 and antenna trimmer C-1 (Fig. 8) for maximum response (Figs. 7 and 8).
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer, (Fig. 7.)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

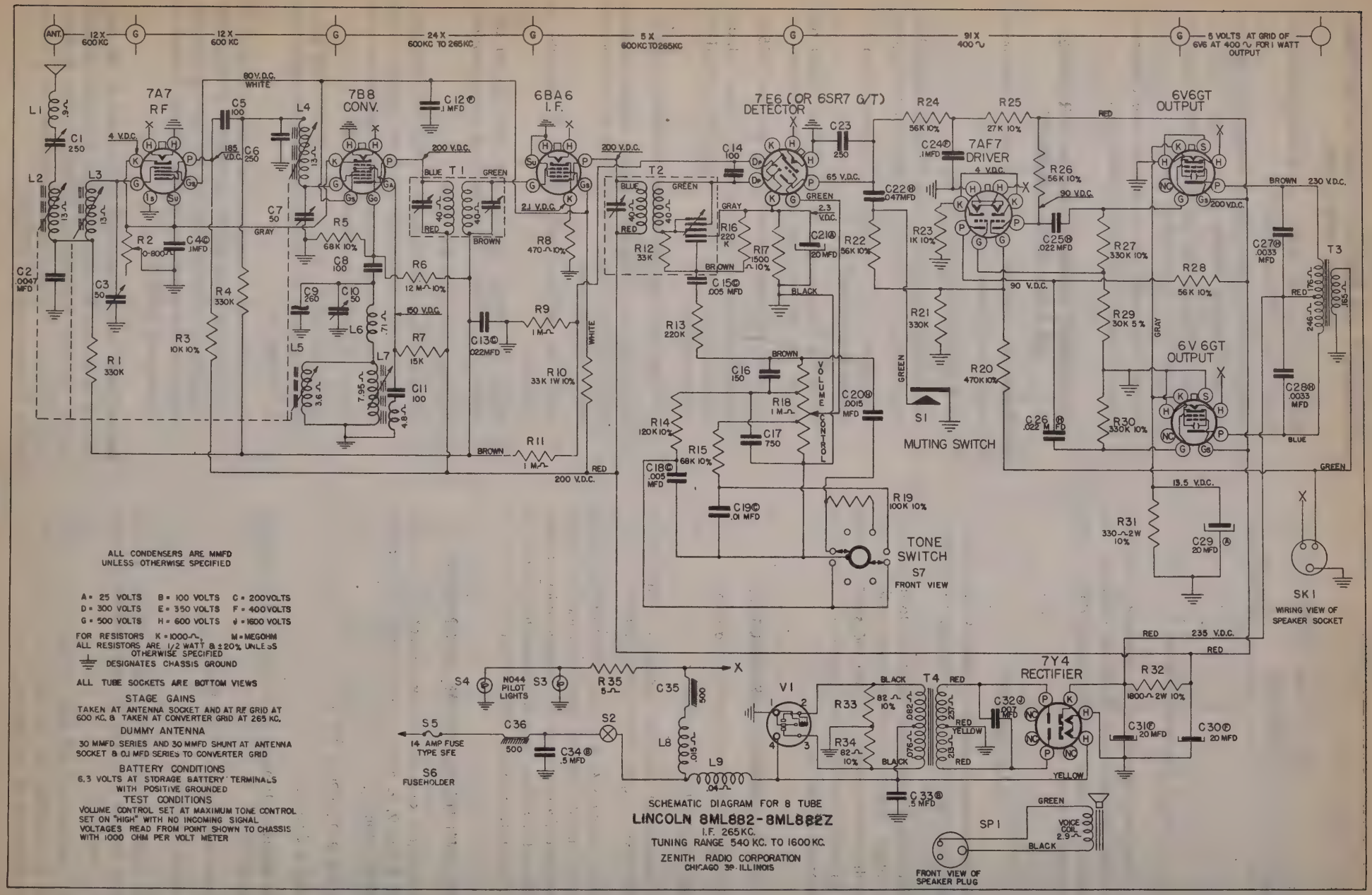
1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. With pliers remove the bushing tension clip from the cross arm insulating bushing.
3. With core alignment tool, part No. S-13064, screw the core in, or out, to the desired position.
4. After all adjustments or replacements are completed, be sure to replace the bushing tension clip.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (Fig. 8) at 1675 Kc.
6. Adjust the converter trimmer C-7, R.F. trimmer C3, and antenna trimmer C-1 (Figs. 7 and 8) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about 1/16 of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (Fig. 7) to scale at 1300 Kc.
10. Adjust the antenna core L-2, R.F. core L3, and converter core L-4 (Fig. 7) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-7 (Fig. 7) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.


ANT.
12 X 600 KC
12 X 600 KC
24 X 600KC TO 265KC
5 X 600KC TO 265KC
91 X 400
5 VOLTS AT GRID OF 6V6 AT 400 FOR 1 WATT OUTPUT
7A7 RF
7B8 CONV.
6BA6 I.F.
7E6 (OR 6SR7 G/T) DETECTOR
7AF7 DRIVER
6V6GT OUTPUT
6V6GT OUTPUT
7Y4 RECTIFIER
MUTING SWITCH
TONE SWITCH S7
FRONT VIEW
VOLUME CONTROL
WIRING VIEW OF SPEAKER SOCKET
SK1
FRONT VIEW OF SPEAKER PLUG
SP1
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED
A = 25 VOLTS B = 100 VOLTS C = 200VOLTS
D = 300 VOLTS E = 350 VOLTS F = 400VOLTS
G = 500 VOLTS H = 600 VOLTS J = 1600 VOLTS
FOR RESISTORS K = 1000-ohm M = MEGOHM
ALL RESISTORS ARE 1/2 WATT & ±20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT RF GRID AT 600 KC. & TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
30 MMFD SERIES AND 30 MMFD SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL
VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
SCHEMATIC DIAGRAM FOR 8 TUBE
LINCOLN 8ML882-8ML882Z
I.F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS

SCHEMATIC

PARTS LIST MODEL 8ML882 (Chassis 8E82)

COILS AND CHOKES

Diagram No.	Part No.	Description	Price
L 9	20-213	Main Hash Choke	$ .36
T 1	95-1077	1st I.F. Transformer	1.85
T 2	95-1078	2nd I.F. Transformer	2.00
L 1	S-8819	Antenna Motor Noise Choke Assembly	.40
L 8	S-11232	Motor Noise Choke Coil Assembly	.22
L 7	S-14225	Oscillator Shunt Coil Assembly	.80
L 6	S-14226	Oscillator Series Coil Assembly	.35
L 3	S-14227	R.F. Coil Assembly	.90
L 2	S-14227	Antenna Coil Assembly	.90
L 4	S-19227	Converter Coil Assembly	.90
L 5	S-14228	Oscillator Coil Assembly	.75
L 2, L 3, L 4, L 5	S-14295	Tuner Coil Unit Assembly	6.25

CONDENSERS

C12	22-170	.1 Mfd	400 V.	.26
C23	22-182	250 Mmfd	500 V.	.26
C 4	22-190	.1 Mfd	200 V.	.23
C17	22-242	750 Mmfd	500 V.	.26
C15, C18	22-906	.005 Mfd	200 V.	.20
C 6	22-1136	250 Mmfd	500 V.	.20
C16	22-1137	150 Mmfd	500 V.	.20
C34	22-1238	.5 Mfd	120 V.	.50
C19	22-1466	.01 Mfd	200 V.	.20
C29, C30, C31	22-1484	Electrolytic 20 Mfd. 25 V. x 20-20 Mfd	400 V.	2.10
C21	22-1553	20 Mfd. Electrolytic	25 V.	.80
C 9	22-1712	260 Mmfd. Compensating		.50
C32	22-1713	.007 Mfd	1600 V.	1.00
C 7	22-1715	Single Section Trimmer (Converter)		.35
C 1	22-1721	Single Section Trimmer (Antenna)		.55
C 3, C10	22-1722	Two Section Trimmer (R.F. and Osc.)		.60
C33	22-1728	.5 Mfd	100 V.	.55
C 5, C11, C14	22-1730	100 Mmfd. Ceramic (or 22-162)	500 V.	.20
C20	22-1743	.0015 Mfd	600 V.	.20
C27, C28	22-1747	.0033 Mfd	600 V.	.26
C24	22-1748	.1 Mfd	400 V.	.26
C22	22-1749	.047 Mfd	600 V.	.35
C25, C26	22-1750	.022 Mfd	600 V.	.26
C13	22-1751	.022 Mfd	200 V.	.20
C 2	22-1752	.0047 Mfd. (or 22-1022)	600 V.	.26

RESISTORS

Diagram No.	Part No.	Description	Price
R35	63-1375	5 Ohm (Wirewound) 2 W.	$ .33
R 2	63-1379	Sensitivity Control	.56
R10	63-1398	33M Ohm 1 W.	.24
R18, S 7	63-1590	Volume Control and Tone Switch	2.50
R32	63-1620	1800 Ohm 2 W.	.36
R31	63-1622	330 Ohm 2 W.	.36
R34, R35	63-1740	82 Ohm ½ W.	.21
R 8	63-1771	470 Ohm ½ W.	.21
R23	63-1785	1000 Ohm ½ W.	.21
R17	63-1792	1500 Ohm ½ W.	.21
R 3	63-1827	10M Ohm ½ W.	.21
R 7	63-1835	15M Ohm ½ W.	.21
R25	63-1845	27M Ohm ½ W.	.21
R29	63-1846	30M Ohm ½ W.	.21
R12	63-1849	33M Ohm ½ W.	.21
R22, R24, R26, R28	63-1859	56M Ohm ½ W.	.21
R 5, R15	63-1862	68M Ohm ½ W.	.21
R19	63-1869	100M Ohm ½ W.	.21
R14	63-1873	120M Ohm ½ W.	.21
R13, R16	63-1884	220M Ohm ½ W.	.21
R27, R30	63-1890	330M Ohm ½ W.	.21
R 1, R 4, R21	63-1891	330M Ohm ½ W.	.21
R20	63-1897	470M Ohm ½ W.	.21
R 9, R11	63-1912	1 Megohm ½ W.	.21
R 6	63-1960	15 Megohm ½ W.	.21

MISCELLANEOUS

	12-1414	Set Mounting Bracket (2 used)	.03
	12-1432	Set Installation Bracket	.15
	46-715	Antenna Trimmer Knob (used on 22-1721)	.07
SP 1	49-627	P.M. Speaker (6" x 9" Oval)	7.75
S 6	52-451	Battery Cable—Fuse to Set—Fuse Holder	.35
	52-455	Volume Control Cable	.70
	52-470	Speaker Cable and Plug	.45
	73-50	No. 6-32 x ¼" Headless Slotted Set Screw—Cuppoint	.02
	78-596	Socket—Loktal Tube	.18
SK 1	78-728	Socket—Speaker	.20
	78-782	Miniature Tube Socket	.25
	78-796	Socket—Antenna Connector	.20
	78-801	Socket—Octal Base Tube	.15
	78-804	Socket—Vibrator	.20
	93-888	Vibrator Cushion Washer	.04

Diagram No.	Part No.	Description	Price
T 4	95-1071	Power Transformer	$7.50
T 3	95-1079	Output Transformer	4.00
	125-63	Rubber Grommet (used on S-14295)	.03
	126-553	Miniature Tube Shield	.11
	149-63	Iron Core and Spring (4 used)	.40
V 1	190-22	Vibrator	4.15
	196-91	Speaker Gasket	1.25
	199-81	Tone Gear Sleeve	.02
	202-567	Instruction Book (Owner's Manual)	.08
	202-607	Interference Elimination Instruction Sheet	.12
	S-14303	Speaker and Gasket Assembly (Use 49-627 and 196-91)	

DIAL ASSEMBLY

	12-1435	Dial Scale Retaining Bracket (2 used)	.01
	19-165	Insulating Bushing Tension Clip (4 used)	.03
	26-392	Dial Scale	3.00
	46-708	Tone Control Knob	.45
	46-714	"Off" Switch Knob	.35
	56-228	Cross Arm Guide Rod	.15
	57-1338	Escutcheon	2.00
	57-1356	Dial Background Plate	.60
	59-208	Dial Pointer	.40
	80-232	Knob Retaining Spring	.02
	80-379	Pointer Retaining Spring	.03
	80-586	Cross Arm Tension Spring (2 used)	.07
	80-625	Pointer Link Tension Spring	.08
S 3-S 4	Dial Light	Bulb—Mazda No. 44	.04
	112-699	No. 4-40 x 3/16" R.H. Self Tapping Screw — Stan Top — Steel — Cad	.01
	114-294	No. 6-20 x 1/4" Hex Hd. Self Tapping Screw—Type No. 25 (Escutcheon Mtg.)	.02
	126-566	Dial Light Shield	.07
	S-14215	Pointer Support Bracket and Stud Assembly	.30
	S-14216	Pointer Drive Link and Stud Assembly	.15
	S-14281	Tuner Unit Assembly	11.50
	S-14300	Cross Arm and Bushing Assembly	1.00
	S-14304	Dial Light Socket and Wire Assembly	.35
	S-14307	Tone Gear and Bushing Assembly	.10
	S-14308	Tone Drum Shaft and Gear Assembly (26-392)	.50
	S-14320	Tuning Control and Trim Knob Assembly (46-705-707)	$1.00
	S-14321	Volume Control Knob and Spring Assembly (46-706)	.50
S 2	85-435	On-Off Switch (on tuner)	.50
	S-14754	Automatic Knob and Screw Assembly	.50
	S-14721	Clutch Plate and Washer	.65
	S-14727	Tuning Shaft, Pinion Gear and Coupling Assembly	.50
S 1	S-14733	Muting Switch Assembly	.05
	17-102	Cam Lock (5 used)	.03
	34-177	Clutch Gear	.70
	64-162	.088 D x 3/32" Rivet (2 used on S-14733)	.004
	73-118	No. 6-32 x 1/4" Hex Head Slotted Set Screw (2 used)	.02
	80-640	Yoke Tension Spring (2 used)	.08
	80-641	Clutch Release Bar Spring	.007
	80-642	Clutch Spring	.02
	93-921	Tuning Shaft Steel Washer	.02
	93-922	Tuning Shaft Spring Washer	.02
	93-923	Fishpaper Washer (2 used)	.004
	97-305	Clutch Arm Stud	.03
	117-149	Clutch Lever	.15
	118-111	Retaining Ring (2 used)	.015

INSTALLATION PARTS

	S-14317	Installation Kit Assembly (complete)	.70
	52-458	Battery Cable (Fuse to Ammeter)	.40
	54-157	1/4-20 x 7/16" x 3/16" Hex Nut	.07
	54-189	No. 8-32 Wing Nut	.02
	54-265	No. 8-32 Wing Nut (Forged)	.04
	93-161	1/4" External Shakeproof Lockwasher	.01
	93-755	No. 8 External Shakeproof Lockwasher	.01
	114-175	1/4-20 x 1/2" Hex Hd. M. Screw	.02
S 5	136-11	14 Amp. Fuse (Type SFE-14)	.12

MOTOR NOISE SUPPRESSION KIT

	S-14285	Motor Noise Suppression Kit Assembly (complete)	2.50
	22-1601	Generator Capacitor	1.20
	22-1767	Ignition Coil Capacitor	1.00
	63-1046	Distributor Suppressor	.31
	80-579	Motor Hood Bond Spring	.09
	112-365	No. 8 x 1/2" B.H. Sheet Metal Screw	.01

PARTS LIST MODEL 8ML882Z (Chassis 8E82)

The parts list for Model 8ML882Z is the same as for Model 8ML882 with the following parts omitted and added:

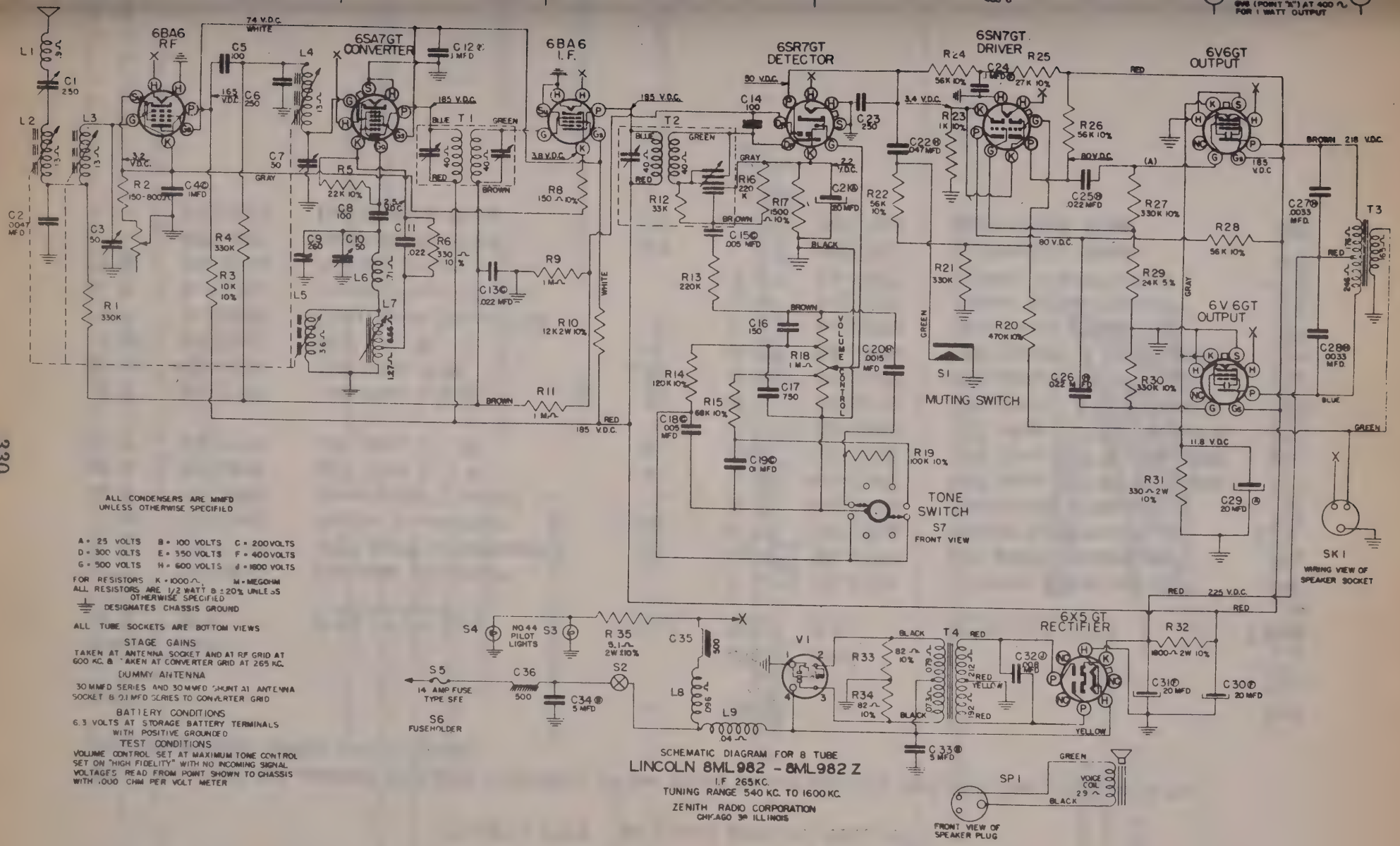
ADD

Part No.	Description	Price
196-110	Speaker Gasket	$ .01
202-573	Instruction Book	.12
202-615	Interference Elimination Sheet	.12
49-627	P.M. Speaker (6" x 9" oval)	7.75
S-14325	Installation Kit Assembly	.70

OMIT

Part No.	Description
196-91	Speaker Gasket
202-567	Instruction Book
202-607	Interference Elimination Sheet
S-14303	Speaker and Gasket Assembly
S-14317	Installation Kit Assembly

(Prices subject to change without notice)


6BA6 RF
6SA7GT CONVERTER
6BA6 I.F.
6SR7GT DETECTOR
6SN7GT DRIVER
6V6GT OUTPUT
6V 6GT OUTPUT
6X5 GT RECTIFIER
MUTING SWITCH
S1
TONE SWITCH
S7
FRONT VIEW
VOLUME CONTROL
SK1
WIRING VIEW OF SPEAKER SOCKET
SP1
VOICE COIL 2.9 Ω
FRONT VIEW OF SPEAKER PLUG
T1
T2
T3
T4
V1
S2
S3
S4
S5
S6
NO.44 PILOT LIGHTS
14 AMP FUSE TYPE SFE
FUSEHOLDER
74 V.D.C.
185 V.D.C.
225 V.D.C.
218 V.D.C.
80 V.D.C.
11.8 V.D.C.
3.2 V.D.C.
3.8 V.D.C.
3.4 V.D.C.
22 V.D.C.
30 V.D.C.
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED
A = 25 VOLTS B = 100 VOLTS C = 200 VOLTS
D = 300 VOLTS E = 350 VOLTS F = 400 VOLTS
G = 500 VOLTS H = 600 VOLTS d = 1600 VOLTS
FOR RESISTORS K = 1000 Ω M = MEGOHM
ALL RESISTORS ARE 1/2 WATT B ±20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT RF GRID AT 600 KC. & TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
30 MMFD SERIES AND 30 MMFD SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH FIDELITY" WITH NO INCOMING SIGNAL VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1,000 OHM PER VOLT METER

SCHEMATIC DIAGRAM FOR 8 TUBE
LINCOLN 8ML982 - 8ML982Z
I.F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO 39 ILLINOIS

See Other Side For Information Concerning Parts List

PARTS LIST MODELS 8ML982-8ML982Z

The parts list for models 8ML982-8ML982Z is the same as for models 8ML882-8ML882Z with the following parts added and omitted.

ADD

Diag. No.	Part No.	Description	Price
C 1	22-1812	Antenna Trimmer	
C 11	22-1751	.022 MFD Condenser	.20
C 32	22-1448	Buffer Condenser	1.00
R 2	63-1662	Sensitivity Control	
R 5	63-1841	22K ohm 1/2 W.	.21
R 6	63-1764	330 ohm 1/2 W.	.21
R 8	63-1750	150 ohm 1/2 W.	.21
R 10	63-1623	12K ohm 2 W.	.36
R 29	63-1843	24K 1/2 W.	.21
L 7	S-14846	Oscillator Shunt Coil	
L 8	S-14761	Motor Noise Choke	
T 4	95-1073	Power Transformer	
	202-641	Instruction Book	.07
	202-643	Instruction Book	.07

OMIT

Diag. No.	Part No.	Description	Price
C 1	22-1721	Antenna Trimmer	.55
C 11	22-1730	100 MMF Condenser	.20
C 32	22-1713	Buffer Condenser	1.00
R 2	63-1379	Sensitivity Control	.56
R 5	63-1862	68K ohm 1/2 W. resistor	.21
R 6	63-1838	18K ohm 1/2 W. resistor	.21
R 7	63-1835	15K ohm 1/2 W. resistor	.21
R 8	63-1771	470 ohm 1/2 W. resistor	.21
R 10	63-1398	33K ohm 1 W. resistor	.24
R 29	63-1846	30K ohm 1/2 W. resistor	.21
L 7	S-14225	Oscillator Shunt Coil	.80
L 8	S-11232	Motor Noise Choke	.22
T 4	95-1071	Power Transformer	7.50
	202-567	Instruction Book	.07
	202-573	Instruction Book	.07

SERVICE MANUAL

ZENITH
LONG DISTANCE AUTO RADIO

Model 8MM890
Lincoln-Mercury Part No.
8M-18805-B

Made by ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, U.S.A.

Electrical Specifications

TUNING RANGE: ..... 540-1600 Kc.

INTERMEDIATE FREQUENCY: ..... 265 Kc.

SENSITIVITY: ..... 5 microvolts at one watt output.

UNDISTORTED POWER OUTPUT: .....
6 watts measured at the voice coil.

SPEAKER: ..... 6″ x 9″ oval, instrument panel mounting.

CURRENT CONSUMPTION: ..... 8 amperes

TUBE COMPLEMENT: ..... 7A7 R.F., 7B8 converter, 6BA6 I.F., 7E6 detector and 1st audio, 7AF7 driver and phase-inverter, 2-6V6GT push pull power output, and 7Y4 rectifier.

IMPORTANT

The Warranty Registration Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

Printed in U.S.A.—5M—3-48—C. P.

Form M-48

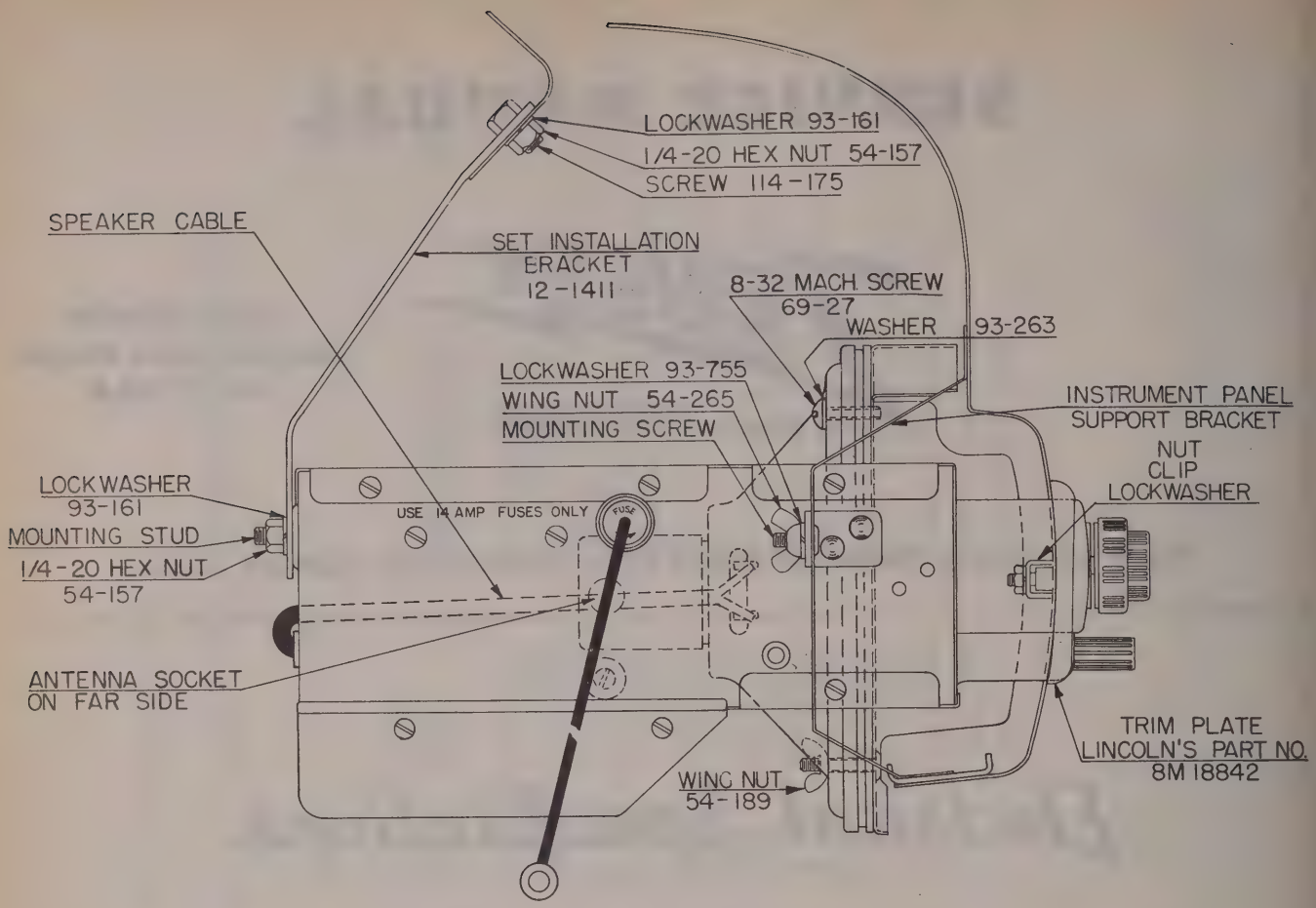


Fig. 1. Set Installed, Cut Away View

RECEIVER INSTALLATIONS

Figures 1 and 2, illustrating the escutcheon plate, control knobs and the installed receiver, are given here to facilitate removal and reinstallation of the receivers when service or repair is necessary.

1. Disconnect the "A" lead at the set. Remove the speaker plug from the set and disconnect the antenna.
2. Loosen the top of the set installation bracket, and remove the bottom of the bracket from the set. (Fig. 1.)
3. Remove the 8/32 wingnuts and lockwashers from the instrument panel support brackets. (Fig. 1.)

To take the speaker from the car, remove the stamped wingnut and the 8/32 machine screws from the rear of the instrument panel. (Fig. 1.)

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push buttons. (Fig. 2.) Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push button (Fig. 2.)

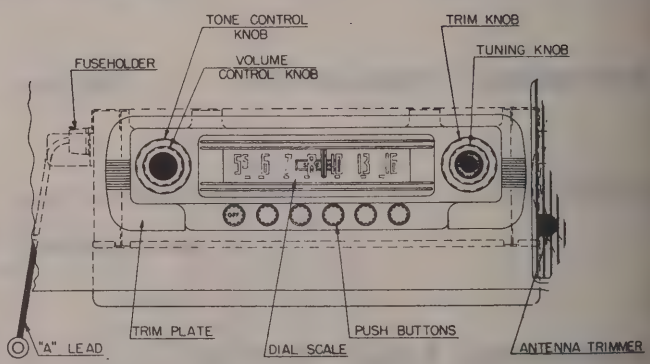


Fig. 2. Front Panel View

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Fig. 2.) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Fig. 2.)

TONE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

AUTOMATIC TUNING:

There are five automatic tuning push buttons located to the right of the "Off" push button. (Fig. 2.)

The five buttons may be adjusted in succession to any desired dial setting. To simplify the identification of the stations, it is advisable to set the buttons in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

To adjust the automatic tuning push buttons:

1. Turn the receiver on and allow it to operate for at least 15 minutes in order for each part to reach normal operating temperature.
2. Tune in the station desired for number 1 position by turning the tuning knob. (Fig. 2.) Be sure to tune to the exact frequency to insure the best tone.
3. Loosen the number one push button, located nearest the "OFF" push button (Fig. 2) by turning it counterclockwise with your fingers not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may fall apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.
4. Press the button in as far as it will go.
5. Release the number 1 button and tighten it by turning it clockwise with your fingers.
6. Use the same procedure for adjusting positions 2, 3, 4, and 5. When the five automatic tuning push buttons have been adjusted to the five desired stations, any one of the five stations can be instantly tuned in by pressing the automatic push button that is adjusted to it.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

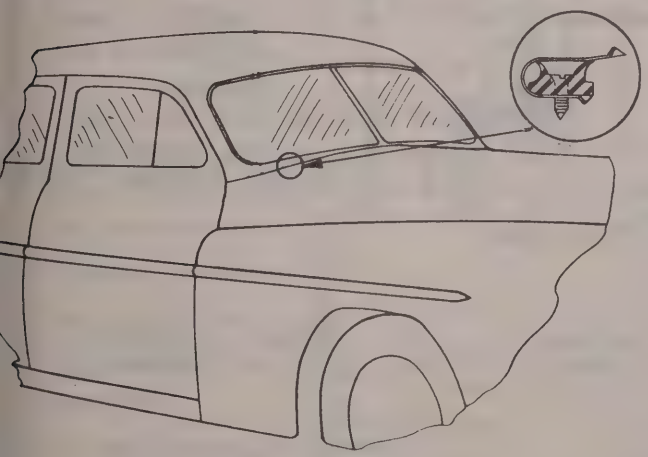


Fig. 3

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 3.

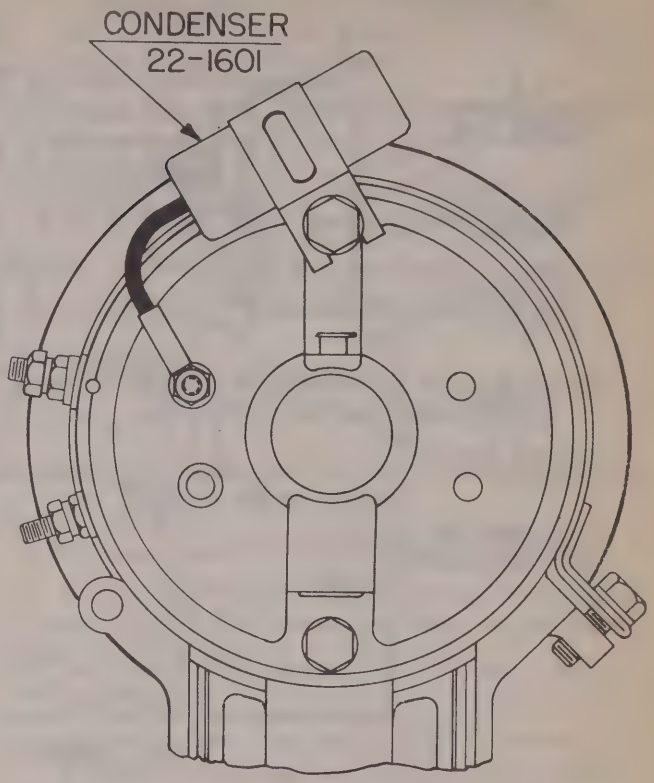


Fig. 4

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 4.)

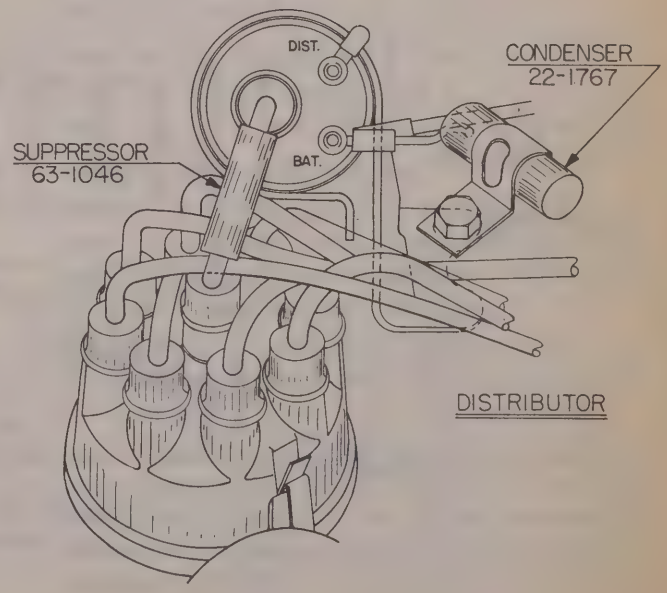


Fig. 5

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1½ inches from the distributor cap (Fig. 5). The ignition coil condenser, No. 22-1767, should be connected to the BAT. terminal of the ignition coil. (Fig. 5.)

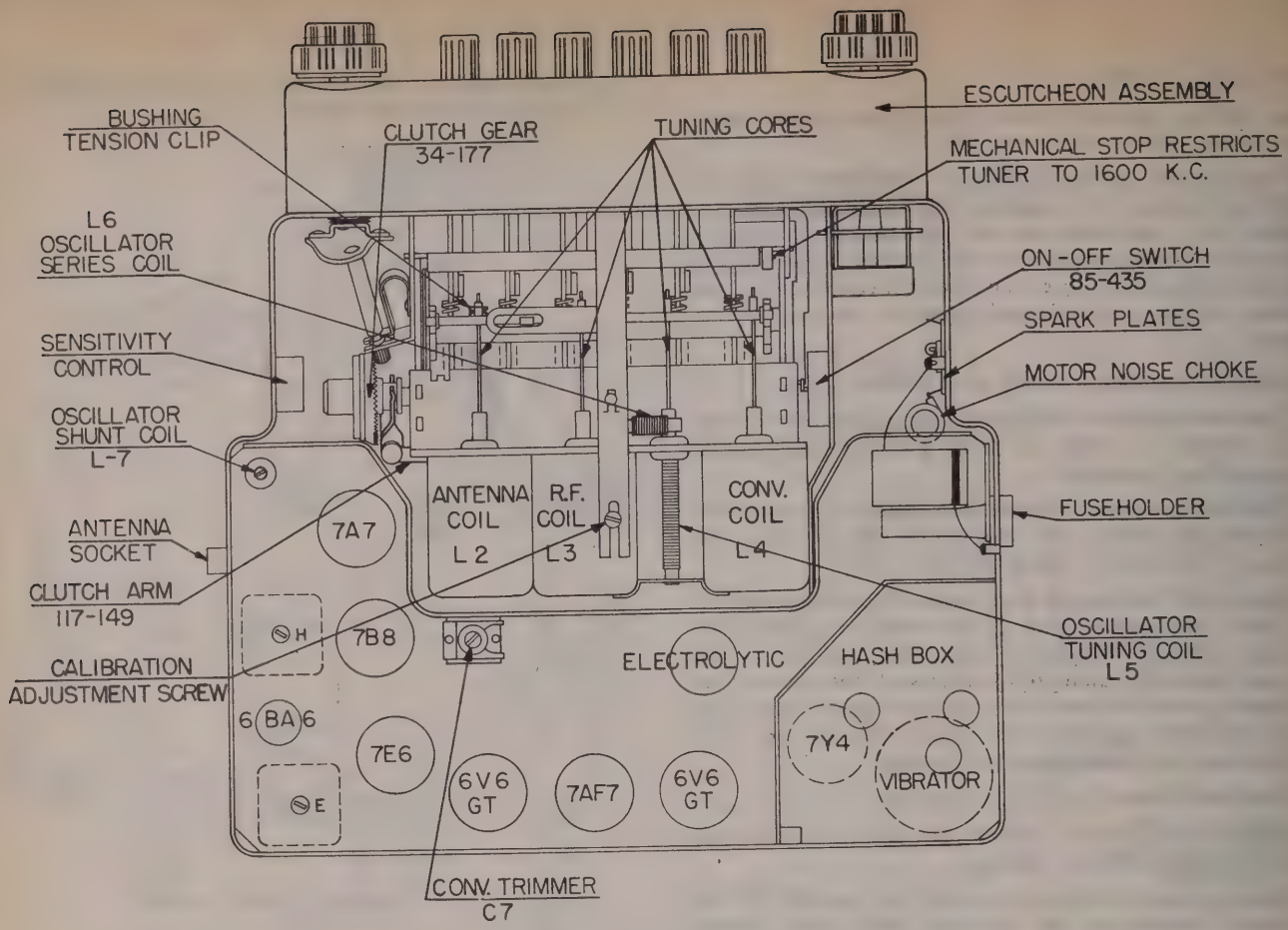


Fig. 6. Top View of Chassis

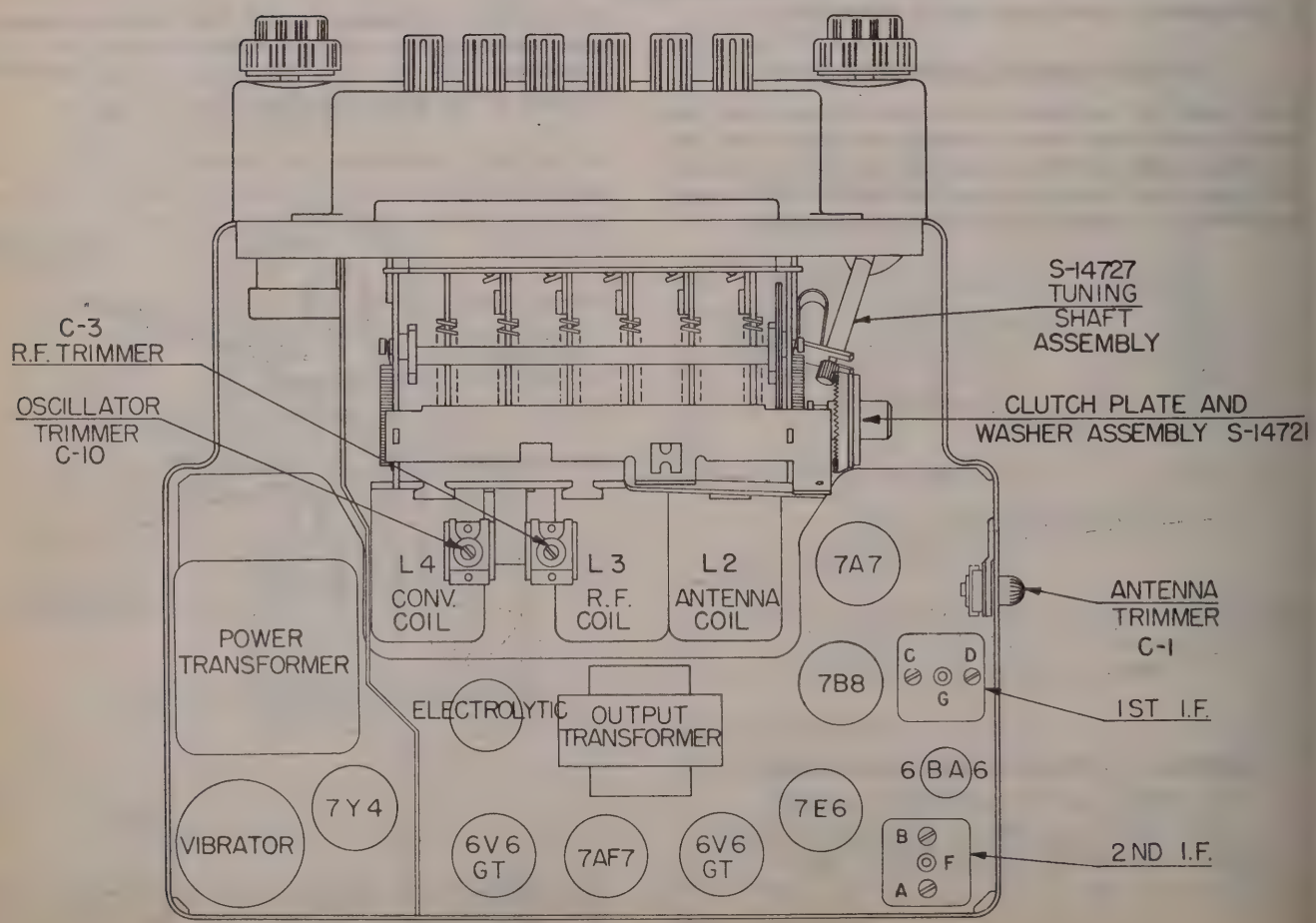


Fig. 7. Bottom View of Chassis

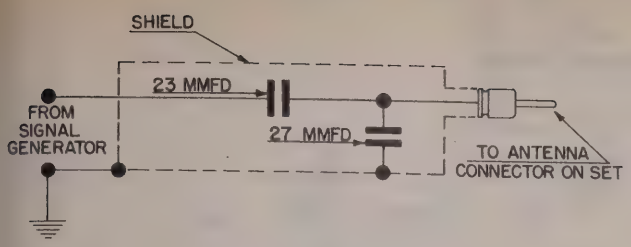


Fig. 8 Dummy Antenna

Figure 8 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output (Fig. 7). Some units have I.F. transformers that are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named for maximum output. Repeat the adjustments to assure accurate alignment. (Figs. 6 and 7.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 8, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 7), for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C3 (Figs. 6 and 7) and antenna trimmer C-1 (Fig. 7) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 6.)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

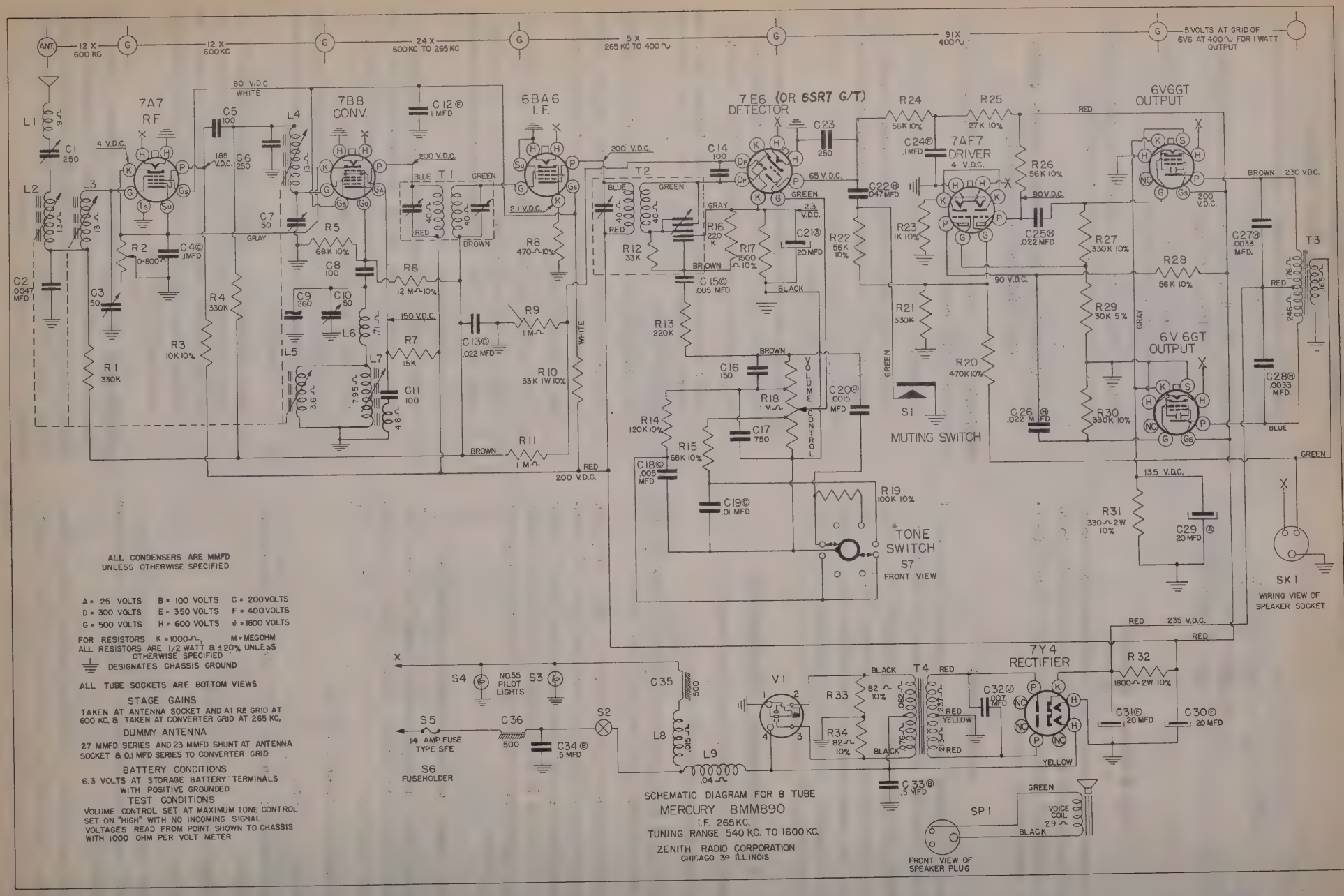
1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. Remove, with pliers, the bushing tension clip from the cross arm insulating bushing.
3. With core alignment tool, part No. S 13064, screw the core in, or out, to the desired position.
4. After all adjustments or replacements are completed, be sure to replace the bushing tension clip.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 8, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, R.F. coil, the converter coil, and the oscillator coil.
5. Adjust oscillator trimmer C-10 (Fig. 7) at 1675 Kc.
6. Adjust converter trimmer C-7, R.F. trimmer C3, and antenna trimmer C-1 (Figs. 6 and 7) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about $1\frac{1}{16}$ of an inch from the end of the coil form).
9. Adjust oscillator core L-5 (Fig. 6) to scale at 1300 Kc.
10. Adjust the antenna core L-2, R.F. core L3, and converter core L-4 (Fig. 6) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-7 (Fig. 6) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.


ANT.
12 X 600 KC
12 X 600KC
24 X 600 KC TO 265 KC
5 X 265 KC TO 400
91 X 400
5 VOLTS AT GRID OF 6V6 AT 400 FOR 1 WATT OUTPUT
7A7 RF
7B8 CONV.
6BA6 I.F.
7E6 (OR 6SR7 G/T) DETECTOR
7AF7 DRIVER
6V6GT OUTPUT
6V6GT OUTPUT
7Y4 RECTIFIER
TONE SWITCH S7
FRONT VIEW
MUTING SWITCH
S1
SK1
WIRING VIEW OF SPEAKER SOCKET
SP1
VOICE COIL 2.9
FRONT VIEW OF SPEAKER PLUG
VOLUME CONTROL
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED
A = 25 VOLTS B = 100 VOLTS C = 200 VOLTS
D = 300 VOLTS E = 350 VOLTS F = 400 VOLTS
G = 500 VOLTS H = 600 VOLTS J = 1600 VOLTS
FOR RESISTORS K = 1000 M = MEGOHM
ALL RESISTORS ARE 1/2 WATT B ±20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT RF GRID AT 600 KC. & TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
27 MMFD SERIES AND 23 MMFD SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL. VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
S4 NO.55 PILOT LIGHTS
S3
S5 14 AMP FUSE TYPE SFE
S6 FUSEHOLDER
S2
SCHEMATIC DIAGRAM FOR 8 TUBE
MERCURY 8MM890
I.F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO 39 ILLINOIS

SCHEMATIC

PARTS LIST MERCURY DE LUXE AUTOMOTIVE RECEIVER

MODEL 8MM890 (CHASSIS 8E90)

Diagram No.	Part No.	Description	Price
		COILS AND CHOKES	
L 9	20-213	Main Hash Choke	$ .36
T 1	95-1077	1st I.F. Transformer	1.85
T 2	95-1078	2nd I.F. Transformer	2.00
L 1	S-8819	Antenna Motor Noise Choke Assembly	.40
L 8	S-11232	Motor Noise Choke Assembly	.22
L 7	S-14225	Oscillator Shunt Coil Assembly	.80
L 6	S-14226	Oscillator Series Coil Assembly	.35
L 3	S-14227	RF Coil Assembly	.90
L 2	S-14227	Antenna Coil Assembly	.90
L 4	S-14227	Converter Coil Assembly	.90
L 5	S-14228	Oscillator Coil Assembly	.75
L 2, L 3, L 4, L 5	S-14295	Tuner Coil Unit Assembly	6.25
		CONDENSERS	
C12	22-170	.1 Mfd. 400 V.	.26
C23	22-182	250 Mmfd. 400 V.	.26
C 4	22-190	.1 Mfd. 200 V.	.23
C17	22-242	750 Mmfd. 500 V.	.26
C15, C18	22-906	.005 Mfd. 200 V.	.20
C 6	22-1136	250 Mmfd. 500 V.	.20
C16	22-1137	150 Mmfd. 500 V.	.20
C34	22-1238	.5 Mfd. 120 V.	.50
C19	22-1466	.01 Mfd. 200 V.	.20
C29, C30, C31	22-1484	Electrolytic 20 Mfd.—25 V. x20-20 Mfd. 400 V.	2.10
C21	22-1553	20 Mfd. Electrolytic. 25 V.	.80
C 9	22-1712	260 Mmfb. Compensating	.50
C32	22-1713	.007 Mfd. 1600 V.	1.00
C 7	22-1715	Single Section Trimmer (Converter)	.35
C 1	22-1721	Single Section Trimmer (Antenna)	.55
C 3, C10	22-1722	Two Section Trimmer (R.F. and Osc.)	.60
C33	22-1728	.5 Mfd. 100 V.	.55
C 5, C11, C14	22-1730	100 Mmfd. Ceramic (or 22-162) 500 V.	.20
C20	22-1743	.0015 Mfd. 600 V.	.20
C27, C28	22-1747	.0033 Mfd. 600 V.	.26
C24	22-1748	.1 Mfd. 400 V.	.26
C22	22-1749	.047 Mfd. 600 V.	.35
C25, C26	22-1750	.022 Mfd. 600 V.	.26
C13	22-1751	.022 Mfd. 200 V.	.20
C 2	22-1752	.0047 Mfd. (or 22-1022). 600 V.	.26

Diagram No.	Part No.	Description	Price
		RESISTORS	
R 2	63-1379	Sensitivity Control	$ .56
R10	63-1398	33M Ohm (Insulated) 1 W.	.24
R18	63-1590	Volume Control and Tone Switch.	2.50
R32	63-1620	1800 Ohm (Insulated) 2 W.	.36
R31	63-1622	330 Ohm (Insulated) 2 W.	.36
R33, R34	63-1740	82 Ohm (Insulated) ½ W.	.21
R 8	63-1771	470 Ohm (Insulated) ½ W.	.21
R23	63-1785	1000 Ohm (Insulated) ½ W.	.21
R17	63-1792	1500 Ohm (Insulated) ½ W.	.21
R 3	63-1827	10M Ohm (Insulated) ½ W.	.21
R 7	63-1835	15M Ohm (Insulated) ½ W.	.21
R25	63-1845	27M Ohm (Insulated) ½ W.	.21
R29	63-1846	30M Ohm (Insulated) ½ W.	.21
R12	63-1849	33M Ohm (Insulated) ½ W.	.21
R22, R24, R26, R28	63-1859	56M Ohm (Insulated) ½ W.	.21
R 5, R17	63-1862	68M Ohm (Insulated) ½ W.	.21
R19	63-1869	100M Ohm (Insulated) ½ W.	.21
R14	63-1873	120M Ohm (Insulated) ½ W.	.21
R13, R16	63-1884	220M Ohm (Insulated) ½ W.	.21
R27, R30	63-1890	330M Ohm (Insulated) ½ W.	.21
R 1, R 4	63-1891	330M Ohm (Insulated) ½ W.	.21
R21, R20	63-1897	470M Ohm (Insulated) ½ W.	.21
R 9, R11	63-1912	1 Megohm (Insulated) ½ W.	.21
	63-1957	12 Megohm (Insulated) ½ W.	.21
		MISCELLANEOUS	
	12-1414	Set Mounting Bracket (2 used)	.03
	46-715	Antenna Trimmer Knob (used on 22-1721)	.07
SP 1	49-627	P.M. Speaker (6" x 9" Oval) (See S-14303)	7.75
S 6	52-451	Battery Cable—Fuse to Set—Fuse-holder	.35
	52-455	Volume Control Cable	.70
	52-470	Speaker Cable and Plug	.45
	73-50	No. 6-32 x ¼" Headless Slotted Set Screw—Cuppoint	.02
	78-596	Socket—Loktal Tube	.18
SK 1	78-728	Socket—Speaker	.20
	78-782	Socket—Miniature Tube	.25
	78-796	Socket—Antenna Connector	.20
	78-801	Socket—Octal Base Tube	.15

Diagram No.	Part No.	Description	Price
	78-804	Socket—Vibrator	$ .20
	93-888	Vibrator Cushion Washer	.04
T 4	95-1071	Power Transformer	7.50
T 3	95-1079	Output Transformer	4.00
	125-63	Rubber Grommet (used on S-14295)	.03
	126-553	Miniature Tube Shield	.11
	149-62	Iron Core and Screw	.10
	149-63	Iron Core and Spring (4 used)	.40
V 1	190-22	Vibrator	4.15
	196-91	Speaker Gasket	1.25
	199-81	Tone Gear Sleeve	.02
	202-587	Instruction Book (Owner's Manual)	.07
	202-608	Interference Elimination Instruction Sheet	.08
	S-14303	Speaker and Gasket Assembly (use 49-627 and 196-91)	

INSTALLATION PARTS

	S-14284	Installation Kit Assembly (complete)	.80
	12-1411	Set Installation Bracket	.10
	52-456	Battery Cable—Fuse to Ammeter	.40
	54-157	No. ¼-20 x 7/16" x 3/16" Hex Nut—Steel, Cad. Pl.	.07
	54-189	No. 8-32 Wing Nut	.02
	54-265	No. 8-32 Wing Nut (Forged)	.04
	69-27	No. 8-23 x ⅜" R.H.M.S.—Steel, N.P.	.01
	93-161	¼ Ext. Shakeproof Lockwasher No. 1114	.01
	93-263	1/32 x .136 x ⅜" Steel Washer—Cad. Pl.	.01
	93-755	No. 8 External Shakeproof Lockwasher	.01
	114-175	¼-20 x ½" Hex Hd. M.S., Steel—Zinc Plate	.01
S 5	136-11	14 Ampere Fuse—Type S.F.E. No. 14	.12

MOTOR NOISE SUPPRESSION KIT

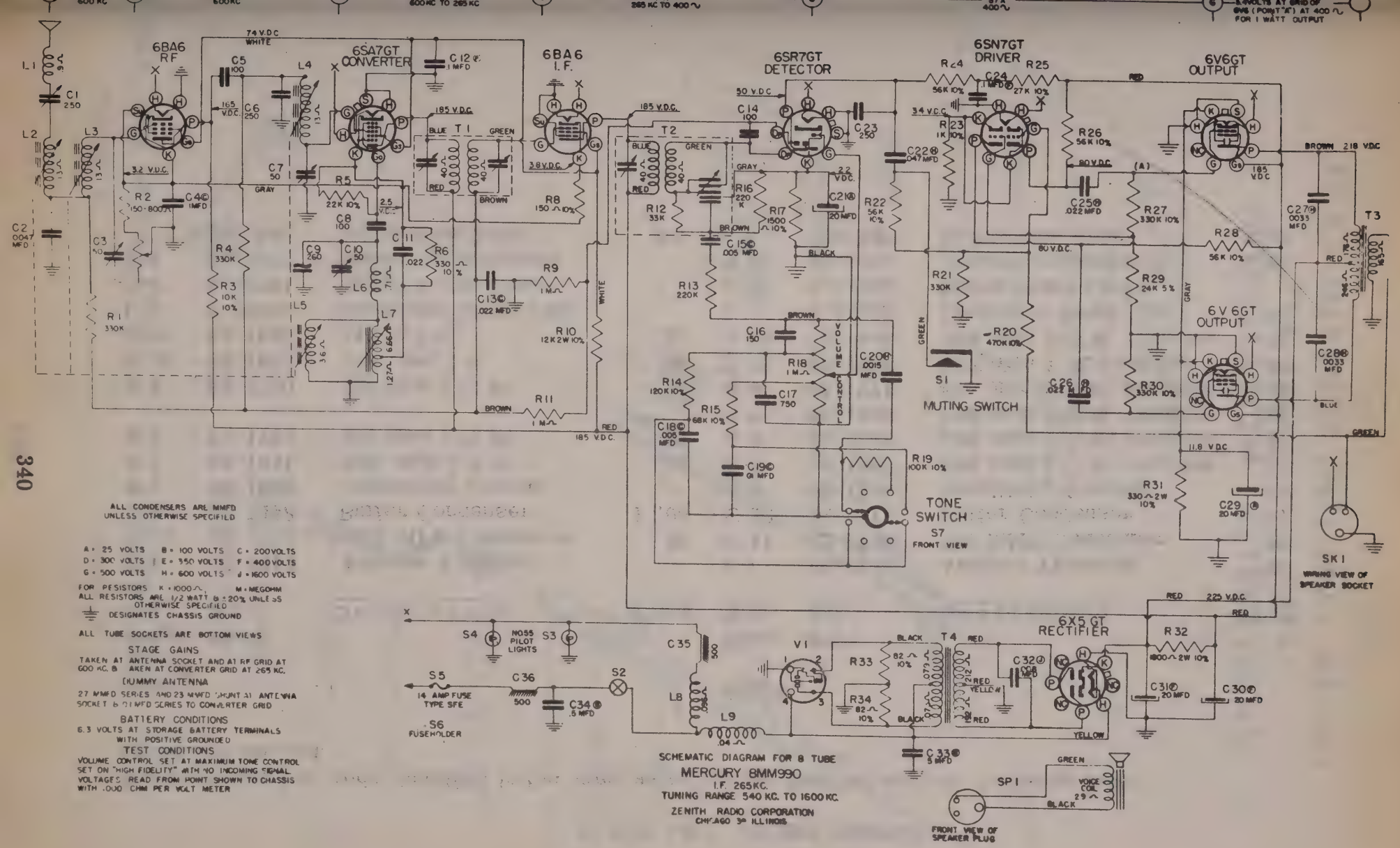
	S-14285	Motor Noise Suppression Kit Assembly (complete)	2.50
	22-1601	Generator Capacitor	1.50
	22-1767	Ignition Coil Capacitor	1.00
	63-1046	Distributor Suppressor	.31
	80-579	Motor Hood Bond Spring	.09
	112-365	No. 8 x ½" B.H. Sheet Metal Screw	.01

DIAL ASSEMBLY

	12-1435	Dial Scale Retaining Bracket (2 used)	.01
	19-165	Insulating Bushing Tension Clip (4 used)	.03

Diagram No.	Part No.	Description	Price
	26-395	Dial Scale	$3.00
	46-701	Tone Control Knob	.45
	46-714	"Off" Switch Knob	.35
	56-228	Cross Arm Guide Rod	.15
	57-1339	Escutcheon	2.50
	57-1344	Dial Background Plate	.50
	59-208	Dial Pointer	.40
	80-232	Knob Retaining Spring	.02
	80-379	Pointer Retaining Spring	.03
	80-586	Cross Arm Tension Spring (2 used)	.07
	80-625	Pointer Link Tension Spring	.08
S 3, S 4	100-31	Dial Light Bulb—Mazda No. 55	.08
	112-699	No. 4-40 x 3/16" R.H. Self Tapping Screw—Stan Top—Steel—Cad	.01
	114-294	No. 6-20 x ¼" Hex Hd. Self Tapping Screw Type No. 25 (Escutcheon Mtg.)	.02
	S-14215	Pointer Support Bracket and Stud Assembly	.30
	S-14216	Pointer Drive Link and Stud Assembly	.15
	S-14281	Tuner Unit Assembly	11.50
	S-14300	Cross Arm and Bushing Assembly	1.00
	S-14301	Tuning Control and Trim Knob Assembly	1.00
	S-14302	Volume Control Knob and Spring Assembly	.40
	S-14304	Dial Light Socket and Wire Assembly	.35
	S-14307	Tone Gear and Bushing Assembly	.10
	S-14308	Tone Drum Shaft and Gear Assembly (26-390)	.50
S 1	S-14534	Tuner Unit Final Assembly	
S 2	85-435	"On-Off" Switch (on Tuner)	.50
	S-14754	Automatic Knob and Screw Assembly	.50
	S-14721	Clutch Plate and Washer	.65
	S-14727	Tuning Shaft, Pinion Gear and Coupling Assembly	.50
S 1	S-14733	Muting Switch Assembly	.05
	17-102	Cam Lock (5 used)	.03
	34-177	Clutch Gear	.70
	64-162	.088 D x 5/32" Rivet (2 used on S-14733)	.004
	73-118	No. 6-32 x ¼" Hex Hd. Slotted Set Screw (2 used)	.02
	80-640	Yoke Tension Spring (2 used)	.08
	80-641	Clutch Release Bar Spring	.007
	80-642	Clutch Spring	.02
	93-921	Tuning Shaft Steel Washer	.02
	93-922	Tuning Shaft Spring Washer	.02
	93-923	Fishpaper Washer (2 used)	.004
	97-305	Clutch Arm Stud	.03
	117-149	Clutch Lever	.15
	188-111	Retaining Ring (2 used)	.015

(Prices subject to change without notice)


6BA6 RF
6SA7GT CONVERTER
6BA6 I.F.
6SR7GT DETECTOR
6SN7GT DRIVER
6V6GT OUTPUT
6V6GT OUTPUT
6X5 GT RECTIFIER
MUTING SWITCH
TONE SWITCH
S7
FRONT VIEW
SK1
WIRING VIEW OF SPEAKER SOCKET
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED
A = 25 VOLTS B = 100 VOLTS C = 200 VOLTS
D = 300 VOLTS E = 350 VOLTS F = 400 VOLTS
G = 500 VOLTS H = 600 VOLTS J = 1600 VOLTS
FOR RESISTORS K = 1000 M = MEGOHM
ALL RESISTORS ARE 1/2 WATT B ± 20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT RF GRID AT 600 KC. & AKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
27 MMFD SERIES AND 23 MMFD SHUNT AT ANTENNA SOCKET & 21 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH FIDELITY" WITH NO INCOMING SIGNAL. VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1,000 OHM PER VOLT METER
SCHEMATIC DIAGRAM FOR 8 TUBE
MERCURY 8MM990
I.F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO 39 ILLINOIS
FRONT VIEW OF SPEAKER PLUG
VOICE COIL 2.9Ω
S1 MUTING SWITCH
S2 S3 S4 NO55 PILOT LIGHTS
S5 14 AMP FUSE TYPE SFE
S6 FUSEHOLDER

See Other Side For Information Concerning Parts List

PARTS LIST MODEL 8MM990

The parts list for model 8MM990 is the same as for model 8MM890 with the following parts added and omitted.

ADD				OMIT			
Diag. No.	Part No.	Description	Price	Diag. No.	Part No.	Description	Price
C 1	22-1812	Antenna Trimmer		C 1	22-1721	Antenna Trimmer	.55
C 11	22-1751	.022 MFD Condenser	.20	C 11	22-1730	100 MMF Condenser	.20
C 32	22-1448	Buffer Condenser	1.00	C 32	22-1713	Buffer Condenser	1.00
R 2	63-1662	Sensitivity Control		R 2	63-1379	Sensitivity Control	.56
R 5	63-1841	22K ohm 1/2 W.	.21	R 5	63-1862	68K ohm 1/2 W. resistor	.21
R 6	63-1764	330 ohm 1/2 W.	.21	R 6	63-1838	18K ohm 1/2 W. resistor	.21
				R 7	63-1835	15K ohm 1/2 W. resistor	.21
R 8	63-1750	150 ohm 1/2 W.	.21	R 8	63-1771	470 ohm 1/2 W. resistor	.21
R 10	63-1623	12K ohm 2 W.	.36	R 10	63-1398	33K ohm 1 W. resistor	.24
R 29	63-1843	24K 1/2 W.	.21	R 29	63-1846	30K ohm 1/2 W. resistor	.21
L 7	S-14846	Oscillator Shunt Coil		L 7	S-14225	Oscillator Shunt Coil	.80
L 8	S-14761	Motor Noise Choke		L 8	S-11232	Motor Noise Choke	
T 4	95-1073	Power Transformer		T 4	95-1071	Power Transformer	7.50
	202-645	Instruction Book	.07		202-587	Instruction Book	.07

FORD MERCURY INTEGRAL AERIAL

FOR 1946 CLOSED CARS

INSTALLATION INSTRUCTIONS

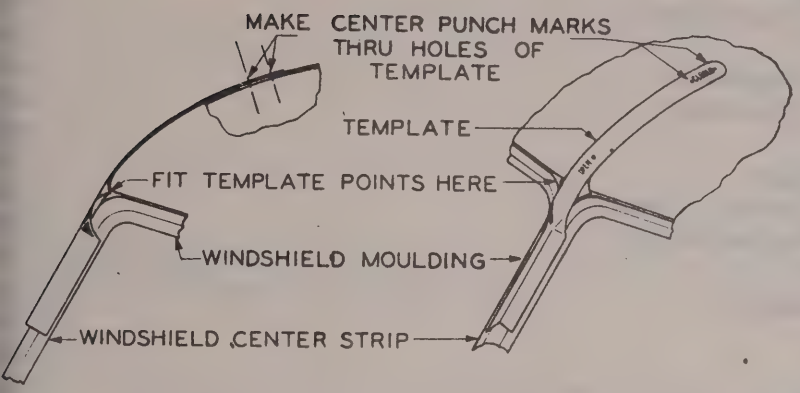


FIGURE 1

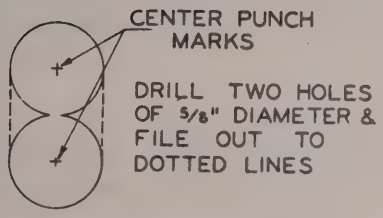
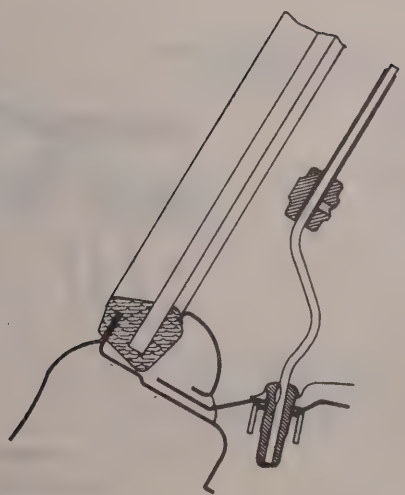
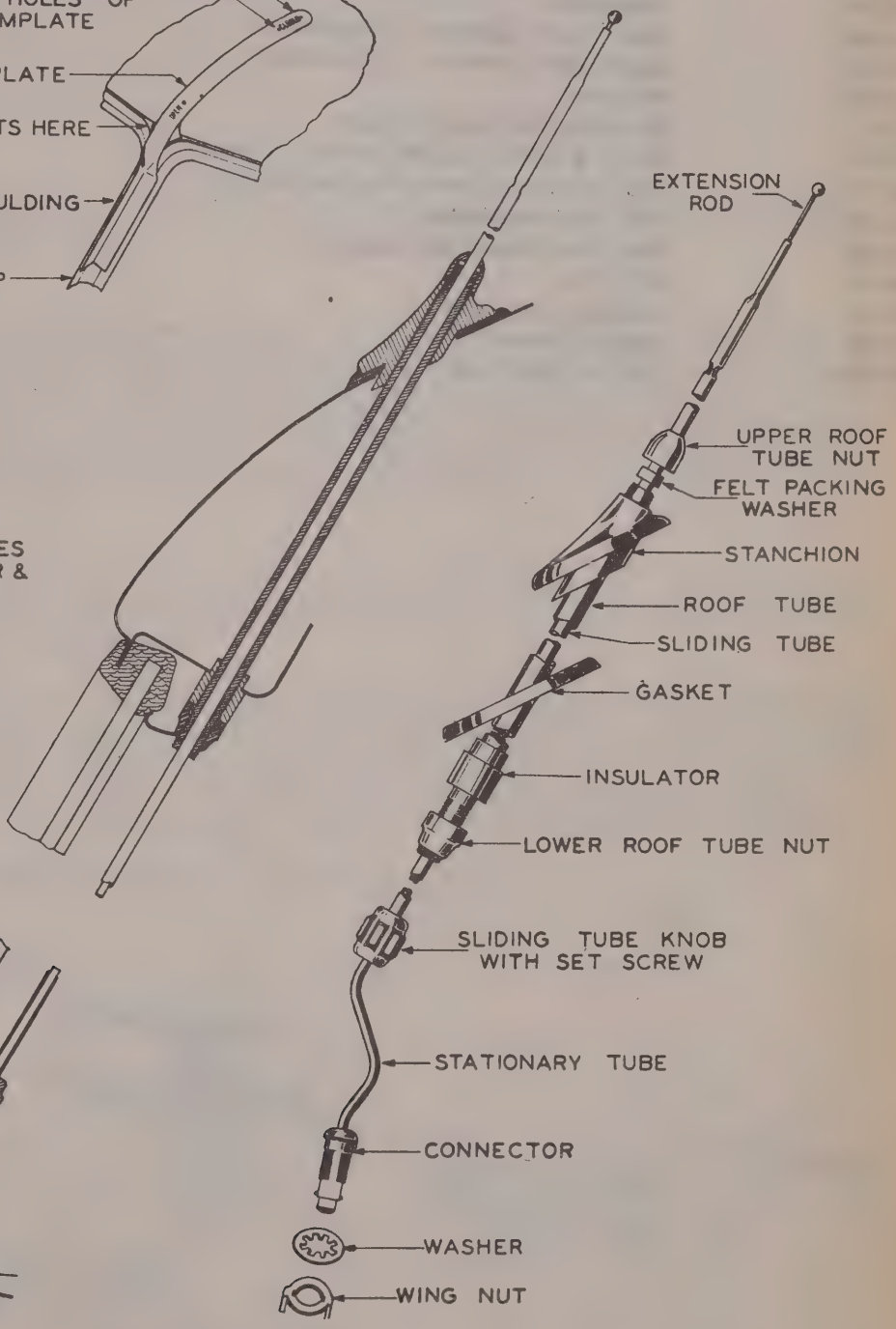


FIGURE 2



COMPLETED INSTALLATION

FIGURE 3



EXPLODED VIEW

FIGURE 4

FORD - MERCURY CLOSED CAR

INTEGRAL ANTENNA

46S10989	Adjusting Knob Assem. (46-523)	.62
S11008	Roof Tube Assem.	.88
S11011	Extension Tube & Rod Assem.	1.21
S11024	Insulator & Stationary Tube Assem.	2.85
46-387	Stanchion	.24
54-154	Upper Roof Tube Nut (Gland Nut)	.24
54-155	Lower Roof Tube Nut (Gland Nut)	.24
54-196	Wing Nut	.022
68-4	#6 Allen Set Screw Wrench	.12
73-40	#6-32 X 1/8 Allen Set Screw - Cuppoint	.19
93-143	3/8" Internal Shakeproof Lockwasher	.67C
93-787	Felt Packing Washer	.70C
94-352	Roof Tube Insulator Bushing	.12
184-5	Ball Tip	.15
193-14	Template (Roof Hole)	.19
196-42	Rubber Gasket	.12
202-416	Instruction Sheet	.01

ZENITH RADIO CORPORATION

PHONE
KSHIRE 7500

ZENITH RADIO

CABLE ADDRESS
"ZENITHRAD"
ALL CODES

6001 DICKENS AVENUE CHICAGO 39, ILLINOIS

ZENITH AUTO RADIO SERVICE BULLETIN #1

REPLACEMENT OF DEFECTIVE PARTS AND TUBES AND THE PURCHASE OF PARTS FOR 1946 ZENITH AUTO RADIOS.

To obtain no-charge replacement of defective parts and tubes in the 90 day warranty, attach a Zenith warranty replacement tag No. 203-26 to each defective item, and forward it to the Zenith distributor in your territory. Do not send warranty replacement tags or warranty tags with service report. (To identify the distributor in your territory, see your Zenith Auto Radio Service Station Official Directory.)

You may purchase new parts from your distributor. If the distributor does not have parts needed in stock, he can order them for you from the Zenith factory.

We manufacture the antenna for the Ford and Mercury closed car only. We are bound by contract to sell the antenna to no one except the Ford Motor Company. However, we supply parts to our distributor for this antenna. For parts and information concerning all other antennas used with the Zenith auto radios, consult the car dealer.

SERVICING FORD-MERCURY ANTENNAS

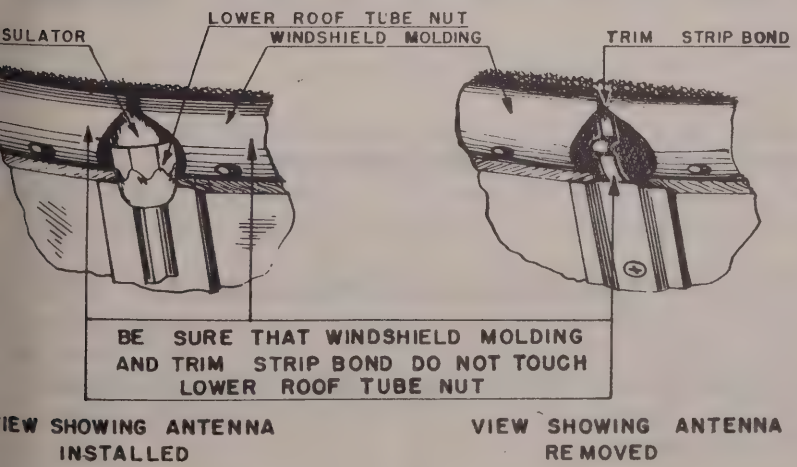

SULATOR
LOWER ROOF TUBE NUT
WINDSHIELD MOLDING
TRIM STRIP BOND
BE SURE THAT WINDSHIELD MOLDING AND TRIM STRIP BOND DO NOT TOUCH LOWER ROOF TUBE NUT
IEW SHOWING ANTENNA INSTALLED
VIEW SHOWING ANTENNA REMOVED

Fig.1.

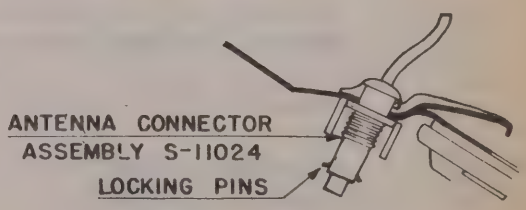


Fig.2.

In some cases, the Ford-Mercury radio will fail to operate because of faulty installation of the antenna, or because of poor connection in the antenna lead.

Therefore, before removing the radio from the car for service, the antenna should be thoroughly checked.

1. Be sure the antenna lower roof tube nut does not touch the trim strip bond or the end of the windshield moulding. (Fig.1.) The trim strip bond can be easily bent away from the nut with a small screwdriver. If the end of the moulding touches the nut, remove the rear vision mirror, loosen the ends of the moulding, and with a half-round file, or a pair of large cutters, trim away the ends of the moulding. Allow approximately 1/8" clearance between the nut and the moulding. When the mirror is replaced, be sure the mirror bracket does not touch the antenna nut.

2. Be sure the antenna lead is properly fastened to the antenna connector at the instrument panel. In order to repair a loose antenna lead, the receiver and speaker should be removed from the car. The loose connection may be caused by either the antenna cable socket spreading open, or the locking pins breaking from the antenna connector. The cable socket can be easily reshaped with a pair of pliers. If the locking pins are broken (Fig.2.), the connector, insulator and stationary tube assembly No. S-11024 must be replaced.

SERVICING AUTOMATIC TUNING MECHANISM

Sometimes the automatic tuning mechanism fails to change from one station to the next, or jams between two stations. If it fails to change, or jams when operated by the automatic tuning switch, but works perfectly by hand, the trouble is probably with the ratchet gear No. 34-133. However, before servicing this gear, check for obvious trouble such as loose, missing or binding parts.

To service the ratchet gear, thoroughly clean the gear, turret ratchet and the turret shaft with naphtha. Lubricate them with a good grade of clock oil. If this does not relieve the condition, replace the ratchet gear.

To replace the ratchet gear:

1. Remove the escutcheon assembly, and loosen the front plate.

2. Remove the indicator drive gear.

CAUTION: DO NOT TURN THE INDICATOR DRUM OR THE TURRET ASSEMBLY WHEN THE DRIVE GEAR IS OFF.

3. Remove the solenoid end plug and bracket assembly which is held in place by one screw on the face plate, and one screw on the rear mounting plate and lever assembly.

4. Remove the cylindrical spacing bushing, indexing disc, ratchet gear return spring, ratchet spacer, and finally the ratchet gear.

5. Install the new ratchet gear. The teeth must be in the same position as the teeth on the original gear in order that the tuning gear mesh with the turret gear properly.

6. Oil the moving parts with a good grade of clock oil, and reassemble the mechanism.

In case either the ratchet lever or the detent lever, that holds the indexing disc in position, is broken or missing, replace the ratchet and bracket assembly, part number S-10831, available at your distributor for a list price of approximately 63 cents. The proceedure for changing the ratchet and bracket assembly is similar to the proceedure for changing the ratchet gear.

REPAIRS TO I.F. TRIMMERS IN 1946 ZENITH AUTO RADIOS

In many cases intermittent operation of the I.F. transformers in the 1946 Zenith auto radio is caused by the trimmers. Often the trimmers can be easily repaired. If, however, a careful check does not reveal the trouble, it is advisable to replace the transformer. Listed below are a few suggestions for checking and repairing the trimmers.

1. Remove the cover from the transformer.

2. Scrape all burrs, sharp edges and other foreign matter from the plate of the trimmers.

3. Replace any mica insulator that is cracked or punctured.

4. Be sure all connections are properly soldered. Make certain there is no excess solder.

5. When replacing the cover, be sure the transformer is properly spaced in the shield to prevent the trimmers or wires from shorting.

MISCELLANEOUS SERVICE TIPS

On the Nash set, be sure the ring spacers are placed on the tuning and volume control shaft before installing the receiver. This will help prevent rattles in the instrument panel caused by the tone control and the escutcheon assembly.

A tuning core wrench, part number S-13064, is almost a necessity when aligning the cores in these receivers. A special wrench for this job is available from your distributor. The distributor will also soon stock the dummy antennas recommended in our service manuals.

ZENITH AUTOMOBILE RADIO SERVICE BULLETIN #2

Model #6MF080, 6MN082, 6MH081,
#7ML080, 7ML081.

Complaints of "Blurp" or Motor Boating As The Set Warms Up.

Check the oscillator grid return, R 5. This should be connected to ground as shown in the Hudson Service Manual instead of to Cathode as shown in all the other manuals.

Changing the resistor R 5 to ground does not affect the operation of the oscillator circuit.

Dead or Intermittent Oscillator

1. Check the 7B8 tube. Be sure the tube is defective before replacing. In some cases a new tube will cause the set to operate temporarily.

2. Check the compensator C-10, the trimmer C-11, and coupler C-9, on Models 6MH081-6MF080-7ML080 (C-8 on Model 6MN082).

3. Carefully measure the resistance of all coils (shunt, series, and tuning). Refer to service schematic for values.

Resistance values within plus or minus 5% of that indicated on the schematic must be obtained for satisfactory operation. This can be done by removing insulation and resoldering, or replacing the damaged part.

Buffer Replacement

When replacing the vibrator it is advisable to check the buffer condenser which is across the secondary of the power transformer. Many vibrator failures are caused by defective buffers. Be sure the capacity checks .008 + — 5% as marked on the wrappers. This is a special metal clad oil impregnated capacitor designed for this job. Therefore, if replacement is necessary, be sure to use the genuine Zenith capacitor #22-1448.

Fuse Replacement

Replace burned out fuses with Zenith part #136-14. This is a new 10 ampere fusetron type MDL10 fuse made by the Bussman Mfg. Co. This new fuse will stand, for several seconds, the overload necessary to operate the automatic tuning mechanism but a small steady

overload will cause it to burn out. This will protect the power transformer when the vibrator sticks or the buffer shorts out.

Lincoln, Dial Pointer Sticks

This complaint is caused by the pointer binding on the upper edge of the Lucite dial scale. Warping of the Lucite causes this condition. A reenforcing strip, part number 83-1352 is available thru your Zenith Distributor. The strip is easily installed by removing the Escutcheon and placing the strip under the upper edge of the dial scale in such a manner that the holes in the foot of the strip align with the 2 rear Escutcheon mounting holes. Replace the Escutcheon with care so that no tension is applied to dial scale. Crimp the two bottom lugs to an angle that will make the bracket clear the pointer. Clearance will occur when the lugs are resting at the center of the top ridge of the Lucite dial scale. Present Lincoln radios are equipped with the reenforcing strip.

Noisy Sets

Many good tubes are being replaced in receivers because they appear noisy when the receiver is jarred. Before replacing the tube, check the socket contacts and clean the tube pins with emery paper.

Intermittent Reception Ford Auto Radio (6MF080)

The customer complains that when driving over car tracks or rough roads the set cuts out. If the car is equipped with a Ford closed car antenna, look for an intermittent short in the connector at the upper end of the lead in, where it contacts the stationary tube of the antenna. An oversize brass washer at the end of the polystyrene insulator in the mounting ferrule touches the sleeve of the lead in, grounding the antenna. To eliminate this condition remove the stationary tube and carefully file or grind down the brass washer until it is smaller than the insulator. Another cause of intermittent or noisy reception, when the set is jarred, is too close spacing of the muting switch located on the tuner mounting plate and lever assembly.

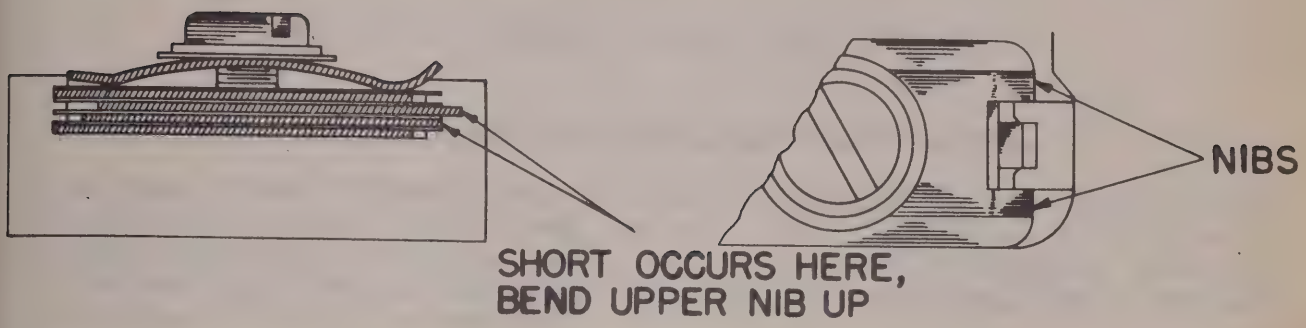
2nd IF Transformer, Part Nos. 95-942 & 95-917

Many cases of trouble due to apparently shorted or open diode sections of 2nd I.F. can be corrected and a permanent repair effected by following the procedure outlined below.

1. If the trouble is suspected in the 2nd I.F., clip or unsolder the ground lead (black, grey wire), which comes out of 2nd I.F. can. If the set then comes to life the trouble is a short between the nibs of the trimmer plates. See illustration. This trouble can be cured by following the proceedure outlined below:

1. Remove the I.F. can from the coil, leaving the coils connected in the set.

2. Remove 7B6 and 7A7 tubes adjacent, for easy access to trimmer.



3. Use a pointed instrument, bend up nibs, as indicated on the drawing on both sides of condenser plates, being careful not to damage mica between plates. This will usually result in a permanent repair, if carefully done.

4. Check your work after re-soldering black wire by applying the B + (250V) of the set momentarily to the diode plate contact of 7B6 tube socket (tube out of socket). No current or arc should occur.

Tire Static

There will be an anti-static powder available in a short time. This material may be obtained from your Zenith Parts Distributor. Instructions for its use are contained in the package.

ZENITH AUTO RADIO SERVICE BULLETIN #3

Distortion in 1946 Ford, Nash and Hudson Receivers.

In some cases intermittent distortion occurs in the 1946 Zenith built Ford, Nash and Hudson radios. This condition is difficult to locate during a bench test. It usually appears when the car has been driven, with the radio operating, for a period of from 15 to 45 minutes.

The trouble is usually caused by the 7C5 output tube drawing grid current when the car battery voltage is raised by continuous charging. Few tube testers will reveal this defect in the 7C5 tubes. It is advisable to check for distortion each 1946 Ford, Hudson, and Nash receiver, brought in for service, by connecting it to an 8 volt (4 cell) storage battery, or a power pack capable of delivering a minimum 7.5 volts, under full load, to the filaments of the tubes.

If distortion occurs after 15 minutes of operation on this excessive battery voltage, replace the 7C5 tube. Check the replacement tube in the same manner as described above.

Tuning Core Replacement.

Your distributor will furnish, for replacement purposes, tuning cores, part #149-44, color coded with one yellow dot. The cores marked with one yellow dot are in the center of the permeability tolerance and are, therefore, suited for replacement in all 1946 and 1947 Zenith auto radios regardless of the color code of the original part. After replacing the core, be sure to realign the receiver as directed in the service manual.

Hudson Pilot Light Bulb.

Replace burned out pilot light bulb with Zenith bulb #100-32, or Mazda #55. Be sure the dial pointer does not touch this larger bulb. The larger bulb #100-32 is used on later production Hudson sets because it gives more light, and longer service.

IMPORTANT PRODUCTION CHANGES

1947 FORD MODEL 6MF780 AFTER SERIAL NO. 240,000

1947 HUDSON MODEL DB-47 AFTER SERIAL NO. 55,450

The antenna tuning coil and tuning core have been omitted. Sensitivity remains the same, however, a slight decrease in image rejection ratio results, which may cause whistle or code interference in some localities. In cases where this condition is objectionable to the customer, it is permissable to shift the I. F. not more than 2 or 3 KC either way, which will minimize or correct the tendency.

Not all Ford and Nash receivers were manufactured with a muting switch on the tuning unit and therefore may be somewhat noisier on the automatic cycle.

There have been no important changes in the Nash, Lincoln, Willys, or Crosley sets. The service material you now have is valid for the above mentioned 1947 sets.

REPAIRING AND ADJUSTING PUSH PULL PERMEABILITY TUNING UNITS.

The tuning assemblies for the various 1947 models, are similar, and carry the same part numbers as in 1946. The only difference being the ommission of one coil and tuning core in the Ford and Hudson.

It is well worth while to carefully study the tuning mechanism. With the help of the permeability tuning unit service manual (form 2), completely dismantle, and reassemble a unit. You will find the job is more simple than appears at first glance. You will handle the maintenance of these receivers for the next several years, and customers may object to paying 18 to 20 dollars for a new tuner unit which you can profitably repair for 6 or 7 dollars.

Many servicemen are replacing the complete push pull tuner unit unnecessarily. It is recommended that, whenever possible, parts, rather than the complete unit be changed. Any part of the unit is replaceable in from 20 to 30 minutes once the unit is disconnected from the radio. However, in the majority of cases, it is not necessary to remove the entire unit. There are three principle parts subject to failure. They are: ratchet and bracket assembly, part number S 10831, ratchet gear, part number 34-133, and turret assembly, part number S 11082.

An occasional cause of trouble is a bent tuning shaft locking lever, this is caused by attempting to push the tuning knob or shaft in after it has been pulled out into the locked position to tune the receiver manually or set up the automatic positions. Occasionally the retaining rivets will be broken out. To repair this damage, replace the back plate (S 10834), or if only slightly bent, straighten, without removing.

Tuning cores and adjusting screws are easily replaced. We recommend that a tuning wrench (Part No. S 13064) be purchased from your Zenith Parts Distributor for aligning the cores. CAUTION; Be sure to cement core adjusting screws securely after final adjustment.

HUDSON PILOT LIGHT BULB

It has been determined that part number 100-36 (Mazda No. 44), has a longer life expectancy than part number 100-32, (Mazda No. 44). Therefore, when replacing burned out pilot bulbs use part number 100-36, (Mazda No. 44). Be sure the dial pointer does not touch the new bulb, as it is somewhat larger in diameter.

IGNITION INTERFERENCE

In some areas, remote from broadcasting stations, ignition interferency may be loud enough to be annoying after the standard interference suppression equipment has been installed. In such cases, the following procedure will relieve this condition:

NASH

1 - Install a heavy battery ground strap bond 85-1446, connecting together the timing gear cover plate and frame member (Fig. 1).

2 - Bond the steering column, at the floor board, to the firewall.

3 - Bond the steering column, at the instrument panel, to the steering column support bracket.

4 - Bond the exhaust pipe, near the front of the muffler, to the floor board of the car, using a battery ground strap.

HUDSON

1 - Install a bond 83-1364 between the rear muffler support bolt and the car frame. (Fig. 2)

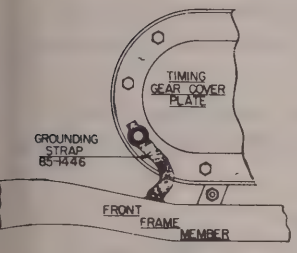


Fig. 1

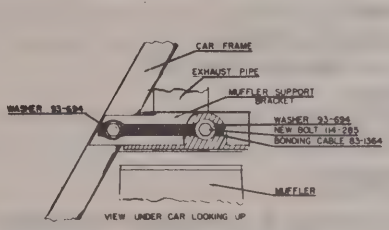


Fig. 2

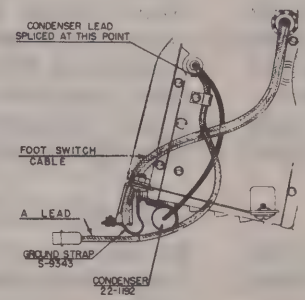


Fig. 3

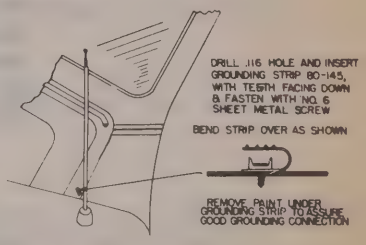

DRILL .116 HOLE AND INSERT GROUNDING STRAP 80-145, WITH TEETH FACING DOWN & FASTEN WITH NO. 6 SHEET METAL SCREW
BEND STRIP OVER AS SHOWN
REMOVE PAINT UNDER GROUNDING STRIP TO ASSURE GOOD GROUNDING CONNECTION

Fig. 4

LINCOLN

1 - Remove the lower left hand rear cover screw from the receiver, see figure 3, and under this screw mount a .5mfd. interference condenser. Also under this screw fasten a two inch piece of heavy copper braid. Splice the lead of the condenser to the "A" lead of the receiver as close to the point where it enters the radio as possible. Connect the loose end of the copper braid, with a sheet metal screw, to the air hopper directly behind the radio. You will find a hole in the hopper that will conveniently accomodate the sheet metal screw.

2 - Add a motor hood bond spring, figure 4, to the body of the car so it will make contact with the lower, rear, left hand tip of the hood.

3 - Remove the left "kick pad" of the car. Remove the antenna from the receiver, and dress the lead up and over the hand brake lever, over the defroster hose, and over the receiver into the antenna socket. Remove a small portion of the rubber sheathing and bond the antenna shield to the car body with a heavy piece of copper braid.

FORD-MERCURY

1 - The oil gauge capacitor No. 22-1326 is not necessary on the average installation. It has, therefore, been eliminated from the Suppression Kit. In some cases it may be necessary to install this condenser. It is available at your Zenith jobber.

Following is a list of parts used on the 1947 models, over and above those used on the 1946 models.

FORD MODEL 6MF780

22-162	100 MMFD 500 V. Mica Condenser
22-1679	Antenna Trimmer
22-1644	Two Section Electrolytic Condenser
S-13646	Oscillator Shunt Coil Assembly
S013650	Right Hand Coil & Shield Assembly (RF)
95-1026	Output Transformer
202-523	Installation Instruction Book
100-36	Dial Light Bulb --- Mazda Type #44
95-1023	Power Transformer
95-1024	(alternate) Power Transformer

HUDSON MODEL DB-47 6MH089

22-162	100 MMFD 500 V. Mica Condenser
22-1679	Antenna Trimmer
22-1644	Two Section Electrolytic Condenser
S-13646	Oscillator Shunt Coil Assembly
S-13650	Right Hand Coil & Shield Assembly (RF)
S-11270	Hand Selector & Muting Switch Assembly
95-1026	Output Transformer
202-548	Installation Instruction Book
100-36	Dial Light Bulb --- Mazda Type #44
95-1023	Power Transformer
95-1024	(alternate) Power Transformer

NASH MODEL 6MN788

S-13398	Escutcheon, Dial Crystal & Key Plate Assembly
S-13443	Tuning Knob & Set Screw Assembly
46-642	Volume Control Knob
95-1026	Output Transformer
95-1023	Power Transformer
95-1024	Power Transformer (alternate)
S-13444	Installation Kit Assembly
22-1644	Two Section Electroyltic Condenser

LINCOLN MODEL 7ML780-7ML781

26-388	Dial Scale

ZENITH RADIO CORPORATION

PHONE
ERKSHIRE 7500

ZENITH RADIO

CABLE ADDRES
"ZENITHRAD"
ALL CODES

6001 DICKENS AVENUE CHICAGO 39, ILLINOIS

AUTO RADIO SERVICE BULLETIN #4

IMPORTANT PRODUCTION CHANGES

1947 FORD MODEL 6MF780 AFTER SERIAL NO. 240,000

1947 HUDSON MODEL DB-47 AFTER SERIAL NO. 55,450

The antenna tuning coil and tuning core have been omitted. Sensitivity remains the same, however, a slight decrease in image rejection ratio results, which may cause whistle or code interference in some localities. In cases where this condition is objectionable to the customer, it is permissable to shift the I. F. not more than 2 or 3 KC either way, which will minimize or correct the tendency.

Not all Ford and Nash receivers were manufactured with a muting switch on the tuning unit and therefore may be somewhat noisier on the automatic cycle.

There have been no important changes in the Nash, Lincoln, Willys, or Crosley sets. The service material you now have is valid for the above mentioned 1947 sets.

REPAIRING AND ADJUSTING PUSH PULL PERMEABILITY TUNING UNITS.

The tuning assemblies for the various 1947 models, are similar, and carry the same part numbers as in 1946. The only difference being the ommission of one coil and tuning core in the Ford and Hudson.

It is well worth while to carefully study the tuning mechanism. With the help of the permeability tuning unit service manual (form 2), completely dismantle, and reassemble a unit. You will find the job is more simple than appears at first glance. You will handle the maintenance of these receivers for the next several years, and customers may object to paying 18 to 20 dollars for a new tuner unit which you can profitably repair for 6 or 7 dollars.

Many servicemen are replacing the complete push pull tuner unit unnecessarily. It is recommended that, whenever possible, parts, rather than the complete unit be changed. Any part of the unit is replaceable in from 20 to 30 minutes once the unit is disconnected from the radio. However, in the majority of cases, it is not necessary to remove the entire unit. There are three principle parts subject to failure. They are: ratchet and bracket assembly, part number S 10831, ratchet gear, part number 34-133, and turret assembly, part number S 11082.

An occasional cause of trouble is a bent tuning shaft locking lever, this is caused by attempting to push the tuning knob or shaft in after it has been pulled out into the locked position to tune the receiver manually or set up the automatic positions. Occasionally the retaining rivets will be broken out. To repair this damage, replace the back plate (S 10834), or if only slightly bent, straighten, without removing.

Tuning cores and adjusting screws are easily replaced. We recommend that a tuning wrench (Part No. S 13064) be purchased from your Zenith Parts Distributor for aligning the cores. CAUTION: Be sure to cement core adjusting screws securely after final adjustment.

HUDSON PILOT LIGHT BULB

It has been determined that part number 100-36 (Mazda No. 44), has a longer life expectancy than part number 100-32, (Mazda No. 44). Therefore, when replacing burned out pilot bulbs use part number 100-36, (Mazda No. 44). Be sure the dial pointer does not touch the new bulb, as it is somewhat larger in diameter.

IGNITION INTERFERENCE

In some areas, remote from broadcasting stations, ignition interferency may be loud enough to be annoying after the standard interference suppression equipment has been installed. In such cases, the following procedure will relieve this condition:

NASH

1 - Install a heavy battery ground strap bond 85-1446, connecting together the timing gear cover plate and frame member (Fig. 1).

2 - Bond the steering column, at the floor board, to the firewall.

3 - Bond the steering column, at the instrument panel, to the steering column support bracket.

4 - Bond the exhaust pipe, near the front of the muffler, to the floor board of the car, using a battery ground strap.

HUDSON

1 - Install a bond 83-1364 between the rear muffler support bolt and the car frame. (Fig. 2)

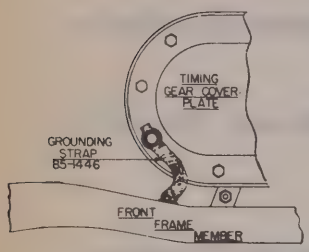


Fig. 1

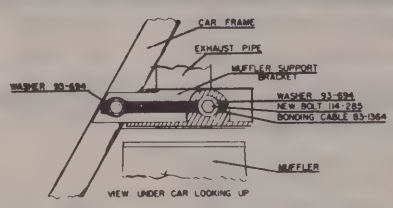


Fig. 2

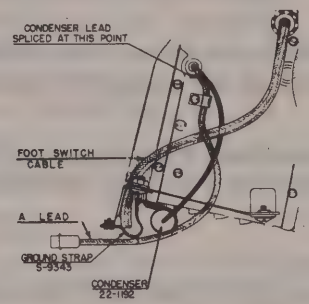


Fig. 3

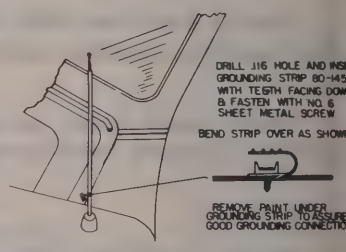


Fig. 4

LINCOLN

1 - Remove the lower left hand rear cover screw from the receiver, see figure 3, and under this screw mount a .5mfd. interference condenser. Also under this screw fasten a two inch piece of heavy copper braid. Splice the lead of the condenser to the "A" lead of the receiver as close to the point where it enters the radio as possible. Connect the loose end of the copper braid, with a sheet metal screw, to the air hopper directly behind the radio. You will find a hole in the hopper that will conveniently accomodate the sheet metal screw.

2 - Add a motor hood bond spring, figure 4, to the body of the car so it will make contact with the lower, rear, left hand tip of the hood.

3 - Remove the left "kick pad" of the car. Remove the antenna from the receiver, and dress the lead up and over the hand brake lever, over the defroster hose, and over the receiver into the antenna socket. Remove a small portion of the rubber sheathing and bond the antenna shield to the car body with a heavy piece of copper braid.

FORD-MERCURY

1 - The oil gauge capacitor No. 22-1326 is not necessary on the average installation. It has, therefore, been eliminated from the Suppression Kit. In some cases it may be necessary to install this condenser. It is available at your Zenith jobber.

PARTS STOCK

Some warranty service stations are not keeping adequate stocks of parts on hand to give prompt service and are depending on the Zenith Distributor to make immediate shipment of small single items It is requested that you keep an adequate stock of parts on hand to cover your needs for at least a period of 60 days. Your distributor may be temporarily out of stock and not be able to supply you on a moments notice.

Following is a list of parts used on the 1947 models, over and above those used on the 1946 models.

FORD MODEL 6MF780

22-162	100 MMFD 500 V. Mica Condenser
22-1679	Antenna Trimmer
22-1644	Two Section Electrolytic Condenser
S-13646	Oscillator Shunt Coil Assembly
S013650	Right Hand Coil & Shield Assembly (RF)
95-1026	Output Transformer
202-523	Installation Instruction Book
100-36	Dial Light Bulb --- Mazda Type #44
95-1023	Power Transformer
95-1024	(alternate) Power Transformer

HUDSON MODEL DB-47 6MH089

22-162	100 MMFD 500 V. Mica Condenser
22-1679	Antenna Trimmer
22-1644	Two Section Electrolytic Condenser
S-13646	Oscillator Shunt Coil Assembly
S-13650	Right Hand Coil & Shield Assembly (RF)
S-11270	Hand Selector & Muting Switch Assembly
95-1026	Output Transformer
202-548	Installation Instruction Book
100-36	Dial Light Bulb --- Mazda Type #44
95-1023	Power Transformer
95-1024	(alternate) Power Transformer

NASH MODEL 6MN788

S-13398	Escutcheon, Dial Crystal & Key Plate Assembly
S-13443	Tuning Knob & Set Screw Assembly
46-642	Volume Control Knob
95-1026	Output Transformer
95-1023	Power Transformer
95-1024	Power Transformer (alternate)
S-13444	Installation Kit Assembly
22-1644	Two Section Electroyltic Condenser

LINCOLN MODEL 7ML780-7ML781

26-388	Dial Scale

-IMPORTANT-

FORD AND MERCURY RECEIVERS WERE ENAMEL PAINTED A DARK MAROON COLOR IN 1946. LATE IN 1946 THE PAINTING WAS DISCONTINUED IN FAVOR FO CADMIUM PLATING AND THE USE OF ALUMINUM.

YOU SHOULD WATCH THE SERIAL NUMBERS OF ALL FORD AND MERCURY RADIOS WHICH ARE ENAMEL PAINTED. THEY ARE NOW OUT OF WARRANTY. WARRANTY HAS ALSO EXPIRED ON HUDSON AND NASH RECEIVERS WITH FOOT VOLUME CONTROL.

I. F. Failure

This trouble was overcome last October. You are requested to furnish the code numbers on defective I.F. transformers you are now replacing. Code numbers appear on the side of the shield can and will be a six digit number. Please include this number on the Warranty Service Report.

The practice of sending auto radios to the factory for service must be discontinued except in extreme cases, and then only on written authority from the Service Department. Otherwise you may be billed for repairs and parts. If you have difficult cases of trouble on Zenith auto radios or are in doubt about procedure, please feel free to write to us. Your letters will receive prompt attention.

May we request that if for any reason you discontinue accepting Zenith built auto radios for warranty service that you advise us. The Service Department appreciates your position in regards to warranty service and takes this opportunity to thank you for doing a good job.

Service Division
Zenith Radio Corporation
Chicago 39, Illinois

ZENITH RADIO CORPORATION

PHONE
XSHIRE 7500

ZENITH RADIO

CABLE ADDRESS
"ZENITHRAD"
ALL CODES

6001 DICKENS AVENUE CHICAGO 39, ILLINOIS

ZENITH AUTOMOBILE RADIO SERVICE BULLETIN #5.

May 1, 1948

Automatic Tuning

The new 1948 line of Zenith auto radios employs a simplified push-button system of automatic tuning in place of the solenoid driven turret mechanism used in previous models. This system is so simple and fool proof, that complete replacement should seldom, if ever, be necessary. The various small parts that may require renewal because of wear or abuse are listed individually in the parts list. However, the complete tuner unit assembly is available should it ever be required.

Do not unscrew the push buttons more than one or two turns. Two turns are sufficient to unlock and reset. If they are completely unscrewed, a cam lock on the plunger assembly will drop out of place. It will then be necessary to open the case, locate the cam lock, and reinsert it on the plunger assembly.

Tube Change

The schematics in the new Lincoln and Mercury service manuals show the tube socket of a 7E6 detector, and the Ford Truck service manual shows the socket of a 6SR7 detector, and the socket of a 7E6 as an alternate. The receivers may actually have either a 7E6 or a 6SR7 detector.

Although the two types of tubes are identical electrically, they are not interchangeable because they require different sockets. When it becomes necessary to service the detector circuit of a Lincoln or Mercury set that employs a 6SR7 tube, refer to the Ford Truck radio service manual.

Warranty Procedure and Service

Auto radio service bulletins Nos. 1, 2, 3 and 4 give valuable service information, and they explain in detail the procedure to follow when performing warranty service for the various car dealers we serve. If any of the above bulletins are missing from your files, please feel free to request new copies from us.

Labor Claims

In the past there has been some misunderstanding and confusion among our service stations in regard to filling out the labor claims. In the lower right-hand corner there is a space marked "Customer's Signature" - meaning, whoever you deliver the receiver to after it has been repaired. It may be the car owner, the car dealer, the car dealer's employee, or the pick-up driver.

Serial Numbers

Care should be exercised in filling out labor claims, particularly in regard to model and serial numbers. As you doubtless realize, we have to draw the line somewhere or pay labor claims indiscriminately We use the serial number as a guide to the length of time a particular radio has been in use. At this time, serial numbers below those listed are considered out of warranty.

On Ford	250,000
On Nash	60,000
On Mercury	15,000
On Lincoln	10,000

We suggest, therefore, that whenever a car dealer tenders an auto radio with lower serial number as within the warranty, you question it. You should refuse to handle the job on a warranty basis, unless some responsible person in the dealership is willing to go on record in writing to the effect that it is within the warranty. Include such information from the car dealer with your labor claim when the serial number indicates the particular radio is beyond the warranty.

Antennas

Since the war, Zenith has supplied only one type auto radio antenna, namely: Zenith Part No. S-11018, Ford Part No. 51A-18813-A1. This antenna mounted at the center of the windshield and projected up through the top of the car. It is the only antenna covered by our warranty, and the only antenna on which we are in a position to supply parts. The car dealer should be referred to his factory for service adjustments or parts on other antennas.

Circuit Change

The oscillator grid return circuit on early production Lincoln, Hudson, Ford and Ford Truck receivers, is shown in Fig. 1. On later production sets R6 is changed to 18,000 ohms and the circuit connected, as shown in Fig. 2.

The purpose of the change was to equalize the gain at all points on the broadcast band. While there is a slight improvement, we do not recommend making this change in the field.

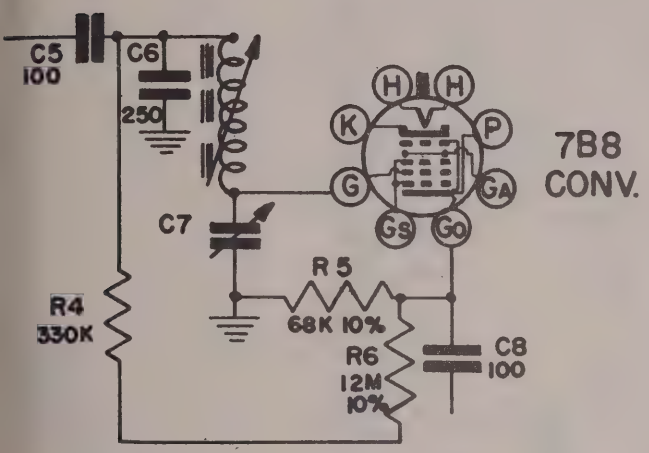


Fig. 1

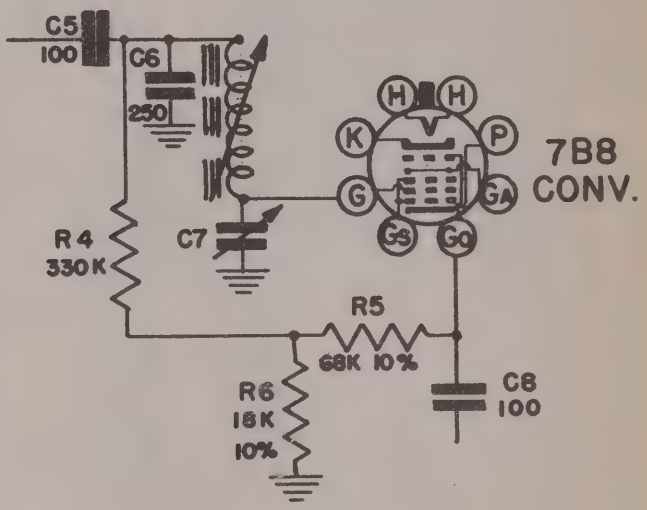


Fig. 2

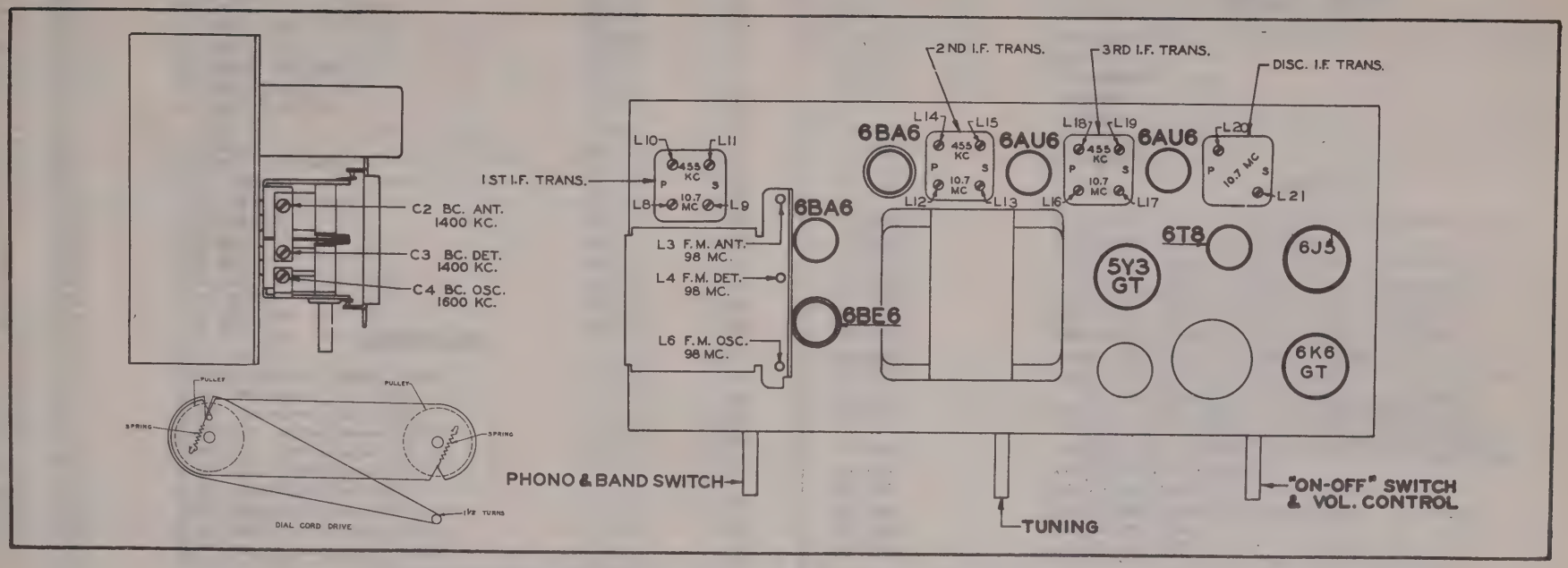
Dead or Intermittent Oscillators in all Post War Auto Sets

1. Check the 7B8 tube. Be sure the tube is defective before replacing. In some cases, simply replacing the tube will cause the set to operate temporarily, even though the real cause of the trouble has not been eliminated.

2. Check the compensator capacitor, the trimmer capacitor and the coupler capacitor. Check the 15 thousand ohm oscillator plate resistor. Carefully measure the resistance of the oscillator shunt coil, oscillator tuning coil and oscillator series coil. Refer to service schematic for values.

Values within plus or minus 5% of that indicated on the schematic must be obtained for satisfactory operation. To obtain a tolerance of plus or minus 5%, replace the part, or in some case the proper resistance on the coils can be obtained by scraping the paint or insulation from the tips of the wires and resoldering.

SERVICE DIVISION
ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 9F22 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

The Radiorgan tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

The 6BA6 1st IF tube is also the phono pre-amplifier. The output from the phono oscillator is fed to the grid of the 6BA6 through C19 and R11. The amplified output is taken from the screen grid and fed back through R12, and C12 into the volume control circuit and the grid of the 6T8 1st audio amplifier.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: A coil slug arrangement tunes the 100 MC FM band. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

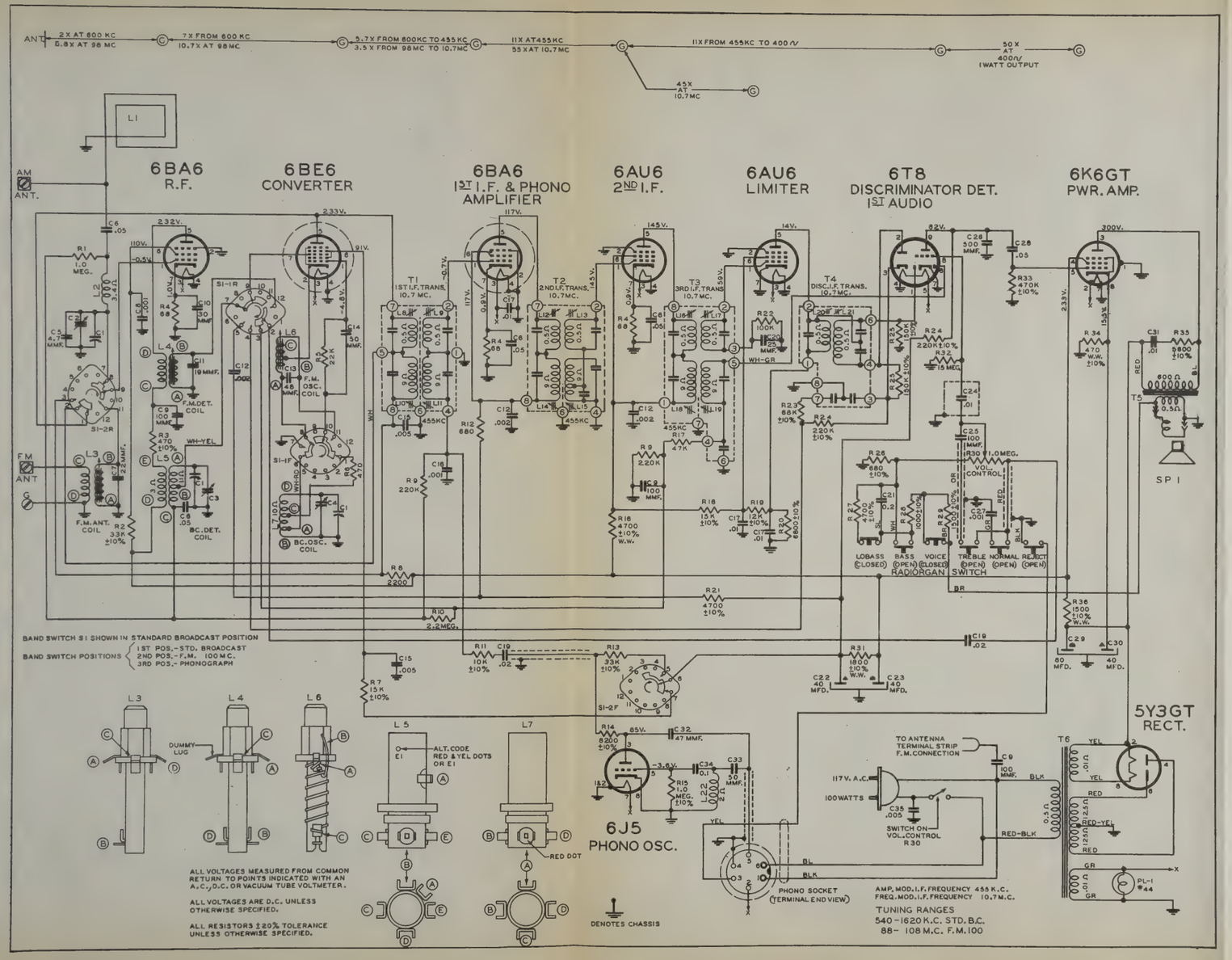
FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

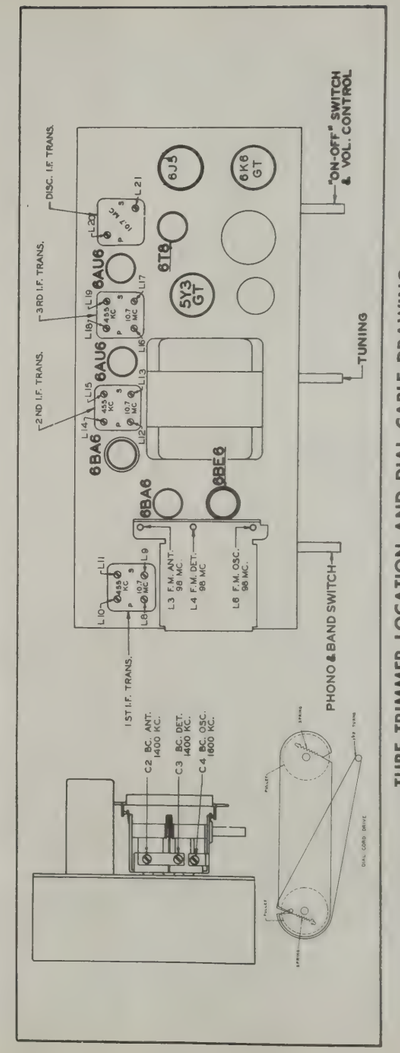
FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1063. Be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z800I) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

MODELS 9H984, 9H984LP
CHASSIS 9F22





TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 9F22 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

The Radiorgan tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change.

The 6BA6 IF tube is also the phono pre-amplifier. The output from the phono oscillator is fed to the grid of the 6BA6 through C19 and R11. The amplified output is taken from the screen grid and fed back through R12, and C12 into the volume control circuit and the grid of the 6T8 1st audio amplifier.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: A coil slug arrangement tunes the 100 MC FM band. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1063. Be sure to add the speaker code letter to the transformer Part Number when ordering replacements. Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction manual for the Zenith Model 800 Signal Generator (Form 28001) covers the complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 6BE6 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-10, 11, 14, 15 16, 18 and 19.	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet.		1600 Kc Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3			1400 Kc. Modulated	BC	1400 Kc.	C3 and C2	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 6AU6 Limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L20 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)		.05 Mfd.	10.7 Mc Unmodulated	FM 100		L21 coil slug sec. of discr.	Adjust secondary of discrimina-or for zero reading.
6 (c)	Pin 1 (grid) on 6AU6 2nd IF.	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L16 and L17 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BA6 1st IF.	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L12 and L13 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 6BE6 converter tube	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L8 and L9 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
9 (c)(d)	FM Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L6 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c)(d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 and L3 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments. The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).

(d) Loosen Slugs by applying a hot iron to the cement.

PART NUMBER	REF. NUMBER	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
12-1434		Dial Light Mtg. Bracket	$ .02
26-418		Dial Scale use S 15394	
59-209		Dial Pointer	.30
76-499		Tuning Control Shaft	.25
78-797		Dial Light Socket	.30
80-69		Dial Cord Tension Spring	.012
80-209		Dial Cord Tension Spring	.024
80-444		Tuner Arm Tension Spring	.05
80-581		Pressure Arm Tension Spring	.10
93-721		Black Felt Washer (used on 59-209)	.005
100-36	PL-1	Dial Light Bulb	.09
188-32		Retaining Ring	1.03 C
S-14254		Pointer Pulley Assy (76-498)	.25
S-14256		Pulley & Bushing Assy.	.50
S-14268		Dial Cord & Eyelet Assy (short)	.05
S-14269		Dial Cord & Eyelet Assy (long)	.06
S-14429		Tuner Arm Assy	.80
S-15394		Dial Scale & Strip Assy. (26-418)	
		COILS & CHOKES	
S-11157	L7	B.C. Oscillator Coil Assy.	.53
S-12259	L6	F.M. Oscillator Coil Assy.	.33
S-12603	L22	Phono Oscillator Coil Assy.	.75
S-13871	L4	F.M. Detector Coil Assy.	.75
S-13970	T1	1st I.F. Transformer Assy.	2.50
S-13971	T2	2nd I.F. Transformer Assy.	2.75
S-13972	T3	3rd I.F. Transformer Assy.	3.00
S-13974	L5	B.C. Detector Coil Assy.	1.00
S-14192	L3	F.M. Antenna Coil Assy.	.70
S-14984	T4	Discriminator Trans. Assy.	
		CONDENSERS	
22-171	C28	.05 Mfd. .600 V.	.26
22-348	C16	.001 Mfd. .500 V.	.26
22-365	C25	100 MMFD (or 22-1670) .500 V.	.20
22-829	C6	.05 Mfd. .200 V.	.20
22-830	C19	.02 Mfd. .600 V.	.20
22-854	C26	.0005 Mfd. .600 V.	.20
22-1041	C35	.005 Mfd. (molded) .400 V.	.20
22-1220	C12	.002 Mfd. .600 V.	.20
22-1367	C14	50 MMFD (ceramic) .500 V.	.33
22-1385	C17	.01 Mfd. .200 V.	.20
22-1418	C34	.1 Mfd. .200 V.	.20
22-1506	C7	22 MMFD (ceramic) .500 V.	.33
22-1507	C20	25 MMFD (ceramic) .500 V.	.33
22-1516	C5	4.7 MMFD (molded) .500 V.	.20
22-1531	C21	.2 Mfd. .200 V.	.20
22-1532	C32	50 MMFD. (or 22-1674) .500 V.	.20
22-1627	C31	.01 Mfd. (or 22-1651) .600 V.	.20
22-1664	C33	50 MMFD (ceramic) .500 V.	.25
22-1669	C9	100 MMFD (ceramic) .500 V.	.20
22-1676	C8	.001 MMFD (ceramic) .500 V.	.40
22-1677	C1	Three gang variable	4.35
22-1688	C11	19 MMFD (ceramic) .500 V.	.30
22-1689	C13	48 MMFD (ceramic) .500 V.	.30
22-1705	C10	30 MMFD (ceramic) .500 V.	.20
22-1706	C15	.005 Mfd. (ceramic)(disc type) .450 V.	.30
22-1717	C27	.001 Mfd. .200 V.	.20
22-1718	C24	.01 Mfd. (shielded) .400 V.	.40
22-1884	C22.23	Two Sect. Electrolytic 40 Mfd. .350VX. 40 Mfd. .450 V.	3.50
22-1885	C29.30	Two Sect. Electrolytic 40 Mfd.-25VX 80 Mfd.-450 V.	4.00
		RESISTORS	
63-943	R21	4700 Ohm Insulated Resistor 10% .1 W.	.24
63-957	R2	33K Ohm Insulated Resistor 10% .1 W.	.24
63-1065	R7	15K Ohm Insulated Resistor 10% .1 W.	.24
63-1222	R34	470 Ohm Insulated W. W. Resistor 10% .1 W.	.24
63-1588	R30	Volume Control & Switch.	1.81
63-1681	R36	Two Section Candohm.	.55
63-1691	R31	1800 Ohm W.W. Zipohm 10% .2 W.	.30
63-1737	R4	68 Ohm Ins. Res. 20% .1/2 W.	.21
63-1771	R3	470 Ohm Ins. Res. 10% .1/2 W.	.21
63-1772	R6	470 Ohm Ins. Res. 20% .1/2 W.	.21
63-1778	R26	680 Ohm Ins. Res. 10% .1/2 W.	.21
63-1779	R12	680 Ohm Ins. Res. 20% .1/2 W.	.21
63-1785	R28	1 K Ohm Ins. Res. 10% .1/2 W.	.21
63-1792	R29	1500 Ohm Ins. Res. 10% .1/2 W.	.21
63-1800	R8	2200 Ohm Ins. Res. 20% .1/2 W.	.21
63-1813	R27	4700 Ohm Ins. Res. 10% .1/2 W.	.21
63-1817	R35	5600 Ohm Ins. Res. 10% .1/2 W.	.21
63-1820	R20	6800 Ohm Ins. Res. 10% .1/2 W.	.21
63-1824	R14	8200 Ohm Ins. Res. 10% .1/2 W.	.21
63-1827	R11	10K Ohm Ins. Res. 10% .1/2 W.	.21
63-1831	R19	12K Ohm Ins. Res. 10% .1/2 W.	.21
63-1834	R18	15K Ohm Ins. Res. 10% .1/2 W.	.21
63-1842	R5	22K Ohm Ins. Res. 20% .1/2 W.	.21
63-1848	R13	33K Ohm Ins. Res. 10% .1/2 W.	.21
63-1856	R17	47K Ohm Ins. Res. 20% .1/2 W.	.21
63-1862	R23	68K Ohm Ins. Res. 10% .1/2 W.	.21
63-1870	R22	100K Ohm Ins. Res. 20% .1/2 W.	.21
63-1876	R25	150K Ohm Ins. Res. 10% .1/2 W.	.21
63-1883	R24	220K Ohm Ins. Res. 10% .1/2 W.	.21
63-1884	R9	220K Ohm Ins. Res. 20% .1/2 W.	.21
63-1897	R33	470K Ohm Ins. Res. 10% .1/2 W.	.21
63-1911	R15	1 Megohm Ins. Res. 10% .1/2 W.	.21
63-1912	R1	1 Megohm Ins. Res. 20% .1/2 W.	.21
63-1926	R10	2.2 Megohm Ins. Res. 20% .1/2 W.	.21
63-1961	R32	15 Megohm Ins. Res. 20% .1/2 W.	.21
63-1998	R16	4700 Ohm W.W. Ins. Res. 10% .2 W.	.33

PART NUMBER	REF. NUMBER	DESCRIPTION	PRICE
		MISCELLANEOUS	
11-108		Line Cord and Plug (9 ft. long)	.80
54-226		Speed Nut - Tinnerman	.01
57-1269		I.F. Trans. Terminal Plate	.06
78-709		Octal Tube Socket	.20
78-750		Six Contact Socket	.25
78-782		Miniature Tube Socket (2 used)	.25
78-788		Noval Miniature Socket	.35
78-793		Octal Tube Socket (2 used)	.15
78-794		Miniature Tube Socket (3 used)	.20
83-1545		Insulating Strip (4 used)	.02
85-442	S1	Band Switch	2.75
95-1063	T5	Output Transformer	2.50
95-1117	T6	Power Transformer	13.00
125-26		Rubber Grommet (2 used) (mts. 78-709)	.025
125-62		Rubber Grommet (4 used)	.02
126-553		Metal Tube Shield	.11
126-569		Heat Shield	.15
149-64		Tuning Core & Spring (3 used)	.40
S-15193		Phono Cable Assy. (or S-15467)	
		RADIORGAN ESC. ASSEMBLY	
57-1351		Radiorgan Esc.	.50
57-1352		Radiorgan Esc.	.50
76-444		Radiorgan Knob Retaining Shaft (2 used)	.04
80-595		Radiorgan Mtg. Spring (2 used)	.05
80-695		Knob Tension Spring	.04
112-533		#6 x 1/4" Rd. Phill. Hd. S.T. Screw Type #25 CAD. (2 each used with S-15449 & S-15397)	
114-159		#6 x 1/4" Hex. Hd. S.T. Screw Type A CAD (2 each used with S-15449 & S-15397)	.72 C
S-14255		Radiorgan Mtg. Bracket Assy	.15
S-14261		Radiorgan Strip & Contact Assy.	.15
S-14273		Radiorgan Knob & Eyelet Assy. (Lo-Bass)	.20
S-14274		Radiorgan Knob & Eyelet Assy. (Bass)	.20
S-14663		Radiorgan Knob & Eyelet Assy. (Voice)	.20
S-14276		Radiorgan Knob & Eyelet Assy. (Treble)	.20
S-14278		Radiorgan Knob & Eyelet Assy. (Normal)	.20
S-15397		Radiorgan Esc. & Knob Assy. (R.H.)	
S-15449		Radiorgan Esc. & Knob Assy. (L.H.)	
		TUBES	
		2 6BA6	
		1 6BE6	
		2 6AU6	
		1 6T8	
		1 6K6GT	
		1 6J5	
		1 5Y3GT	
		CABINET PARTS	
2-139		Cabinet Back	2.00
12-1547		Tone Arm Rest Bracket	
19-9		Cable Clip	
19-88		Cable Clip	.02
19-169		Record Changer Mtg. Clip (4 used)	.07
19-171		Loop Connector Clip (2 used)	.015
27-81		Shaft Bearing Disc	.05
36-39		Record Changer Frame Handle	.60
46-697		Tuning Control Knob (2 used)	.10
46-718		Band Switch Knob	.15
46-786		Band Switch Knob	.15
49-624	SP1	Speaker 12" P.M.	13.00
		208-624 Cone & Voice Coil	4.60
57-1353		Diffusing Plate	.90
57-1469		Dial Escutcheon	
70-83		6 x 1/2" Washer Hd. Wood Screw Steel Stat.Br. (10 used to mount cab. back)	.55 C
72-55		#6 x 3/8" Phill. Fl-Hd. Wood Screw Steel N.P. (2 used with 27-81)	.013
72-58		#2 x 3/8" Phill. Fl. Hd. Wood Screw Steel Brass Pl. (6 used to mount 57-1469)	.015
80-678		Record Changer Mtg. Spring (4 used)	.04
83-1247		Trim Strip	.25
93-392		Brown Felt Washer - 3/32 x 33/64 x 1" (used with 46-697 & 46-718)	1.20 C
112-489		#8 x 1/2" Phill. R.H.S.T. ShakeProof #25 Cad. Pl. (Handle Mtg. Screw)	.028
112-712		Record Changer Mtg. Screw (4 used)	.08
113-17		6-32 x 1/4" R.H.M.S. Steel N.P. Lockwasher Attached (2 used to mount 12-1547 on L.P. only)	
114-78		#8 x 5/16 Hex. Hd. Slotted S.T. Type Z N.P. (used with 19-88)	1.40 C
114-148		#10 x 7/8" Hex. Washer Hd. S.T. Type Z CAD. Pl. (4 used chassis mtg.)	1.20 C
114-233		#14 x 1-1/4" Slotted Hex. Washer Hd. S.T. Type Z CAD	.07
159-52		Plug Button (4 used)	.09
188-91		Rubber Ring (2 used)	.03
192-115		Dial Glass	1.50
196-109		Dial Glass Dust Gasket	.75
202-683		Radio Instruction Book	.10
202-684		Phono Instruction Book	.20
202-685		Phono Instruction Book (L.P. Only)	.10
S-12864		Drive Wheel & Pin Assy.	.24
S-14004		Non-Intermixer Record Changer	
S-14012		Non-Intermixer Record Changer (9H984L.P. only)	
S-14305		Low Impedance Loop	.45
S-15386		Knob & Eyelet Assy (46-778)	
S-15395		Record Changer Mtg. Frame Assy (complete)	
S-15396	L2	Loading Coil Assy.	.80

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 6BE6 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-10, 11, 14, 15 16, 18 and 19.	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet.		1600 Kc Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3			1400 Kc. Modulated	BC	1400 Kc.	C3 and C2	Align det, and ant. stages.
4 (a)	Pin 1 (grid) on 6AU6 Limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L20 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)		.05 Mfd.	10.7 Mc Unmodulated	FM 100		L21 coil slug sec. of discr.	Adjust secondary of discrimina-or for zero reading.
6 (c)	Pin 1 (grid) on 6AU6 2nd IF.	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L16 and L17 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BA6 1st IF.	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L12 and L13 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 6BE6 converter tube	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L8 and L9 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
9 (c)(d)	FM Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L6 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c)(d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 and L3 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments. The signal generator output should be kept just high enough to get an indication on the meter.

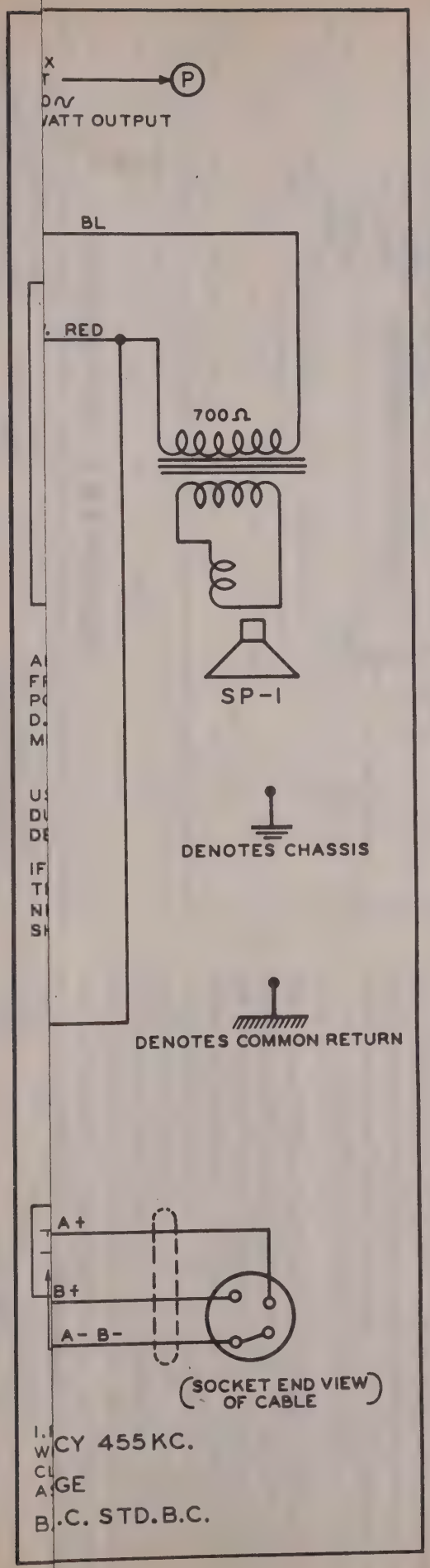
(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).
(d) Loosen Slugs by applying a hot iron to the cement.

INDEX VOLUME IV

MODEL	YEAR	CHASSIS	VOLUME	PAGE
4G903	1949-50-51	4F40	4	365
6R880	1948	6E03	4	367
6R980LP	1948	6E03	4	369
7H820Z	1948	7E01Z	4	509+516A
7H822Z	1948	7E02Z	4	509+518
7H918	1949-50-51	7F03	4	371
7H920	1949	7F01	4	373
7H921	1949	7F04	4	375
7H921Z	1949	7F04Z	4	377
7H922	1949	7F02	4	379
8H832	1948	8E20	4	381
9H981LP	1949	9E21	4	383
9H982RLP	1949	9E21	4	383
9H985LP	1949	9E21	4	383
9H985RLP	1949	9E21	4	383
9H985LPZ	1949	9E21Z	4	383
9H985LPZ1	1949	9E21Z	4	384
9H985RLPZ1	1949	9E21Z	4	385
9H988RLP	1949	9E21	4	383
9H995RLPZ	1949	9E21Z	4	385
9H995RLPZ1	1949	9E21Z	4	385
9H995RLPZ2	1949	9E21Z	4	386
12H990LP	1949	11C21	4	386
12H991E LP	1949	11C21	4	387
12H992RLP	1949	11C21	4	387
12H993RLP	1949	11C21	4	387
12H994GOLP	1949	11C21	4	387
G402	1950-51	4G41	4	389
G500	1950-51	5G40	4	391
G503	1950-51	5G41	4	393
G510	1950-51	5G02	4	395
G511	1950-51	5G01	4	397
G516	1950-51	5G03	4	399
G615	1950	6G05	4	401
G660	1950	6G01	4	403
G663	1950	6G01	4	403
G723	1950	7G04	4	405
G724	1950	7G02	4	407
G725	1950-51	7G01	4	409
G844	1950	8G21	4	411
G881	1950	8G20	4	413
G882	1950	8G20	4	413
G883	1950	8G20	4	413
G884	1950	8G20	4	413
G885	1950	8G20	4	413
G943	1950	9E21Z	4	415
H615	1951	6G05	4	417
H615Z	1951	6G05	4	418A
H661E	1951	6H01	4	419
H661R	1951	6H01	4	419
H665	1951	6H01	4	419
H665R	1951	6H01	4	419
H665Z	1951	6H01	4	419
H665RZ	1951	6H01	4	419
H723	1951	7H04	4	421
H723Z	1951	7H04Z	4	423
H724	1951	7H02	4	425
H724Z	1951	7H02Z	4	427
H725	1951	7G01Z	4	428A
H880RZ	1951	8H20	4	429
H880R	1951	8H20 Revised	4	431
H880R	1951	8H20Z	4	433
H1083E	1951	10H20	4	435
H1086R	1951	10H20	4	435
H1087R	1951	10H20	4	435
H1083E	1951	10H20Z	4	437
H1086R	1951	10H20Z	4	437
H1087R	1951	10H20Z	4	437
S-14009 Record Changer			4	439
S-14010 Record Changer			4	439
S-14011 Record Changer			4	440
S-14012 Record Changer			4	443-451
S-14013 Recprd Changer			4	453
S-14014 Record Changer			4	443-451
S-14015 Record Changer			4	454
S-14016 Record Changer			4	455
S-14019 Record Changer			4	443-451
S-14020 Record Changer			4	457
S-14021 Record Changer			4	443-451
S-14022 Record Changer			4	459-472
S-14023 Record Changer			4	475-484
S-14024 Record Changer			4	459-472
S-14025 Record Changer			4	459-472
S-14026 Record Changer			4	475-484
S-14027 Record Changer			4	459-472
S-14028 Record Changer			4	487-501
S-14029 Record Changer			4	487-501
S-14030 Record Changer			4	487-501
S-14031 Record Changer			4	487-501
S-14032 Record Changer			4	503
S-14033 Record Changer			4	504
S-14034 Record Changer			4	504
S-14036 Record Changer			4	487-501
Household Service Bulletin #5			4	505-520
Household Service Bulletin #6			4	521-524
*8ML985	1949	8F85	4	525-532
*8ML985E	1949	8F85E	4	525-532
*8ML985Z	1949	8F85	4	525-532
*8ML985ZE	1949	8F85E	4	525-532
*8MF983	1949	8F83	4	525-532
*8MF983E	1949	8F83E	4	525-532
*8MM991	1949	8F91	4	525-532
*8MM991E	1949	8F91E	4	525-532
*GL892	1950	8G92	4	533-542
*GL892E	1950	8G92E	4	533-542
*GM891	1950	8G91	4	533-542
*GM891E	1950	8G91E	4	533-542
*GF890	1950	8G90	4	533-542
*GF890E	1950	8G90E	4	533-542
*GH694	1950	6G94	4	545-552
*GH694Z	1950	6G94	4	545-552
*GN695	1950	6G95	4	553-566
*GN596	1950	5G96	4	553-566

*Indicates automotive receivers.

MODEL 4G903
CHASSIS 4F40



MODEL 4G903
CHASSIS 4F40

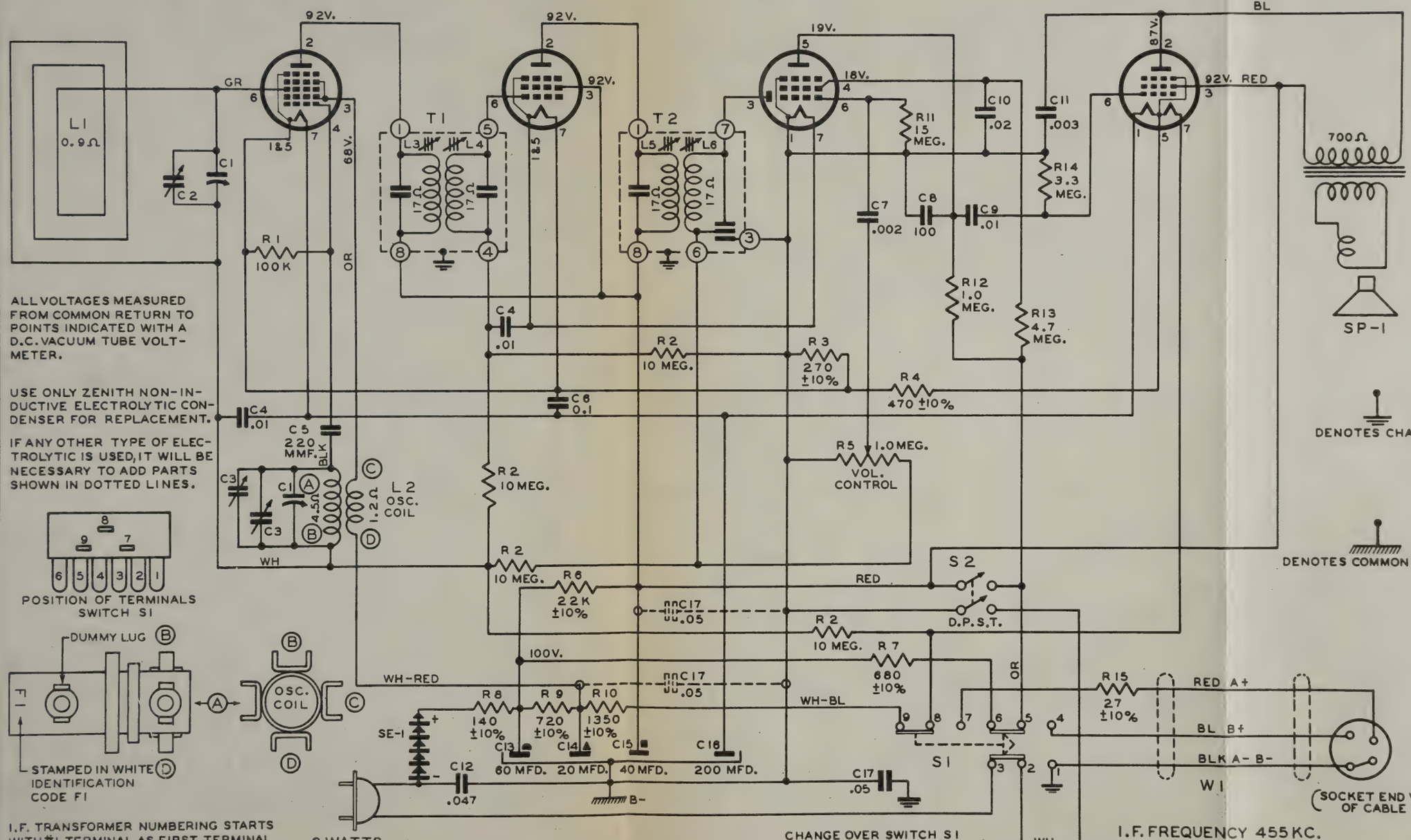
ANT. — 4.7X AT 600KC — G — 28X FROM 600KC TO 455KC — G — 12X FROM 455KC TO 400~ — G — 82X AT 400~ 50 MILLIWATT OUTPUT — G — 17X AT 400~ 50 MILLIWATT OUTPUT — P

1R5 CONVERTER

1U4 I.F.

1S5 DET. AMP.

3V4 PWR. AMP.



ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.

USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT.

IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.

POSITION OF TERMINALS SWITCH S1

I.F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL AS FIRST TERMINAL CLOCKWISE AND ADJACENT TO RED DOT AS VIEWED FROM BOTTOM OF CHASSIS.

BATTERY PACK NO. Z909

9 WATTS
117V. A.C.-D.C.

ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

CHANGE OVER SWITCH S1 SHOWN IN POSITION FOR A.C. OPERATION.

I.F. FREQUENCY 455 KC.

TUNING RANGE
535—1620 K.C. STD.B.C.

(SOCKET END VIEW OF CABLE)

On receivers using Tuning Gang #22-2032, Dial String Assemblies #S-15440 (short) and #S-15441 (long) must be used.

On receivers using Tuning Gang #22-2108, Dial String Assemblies #S-15440 (short) and #S-16106 (long) must be used.

PARTS LIST

PART NO.	REF.NO.	DESCRIPTION		PRICE
		DIAL ASSEMBLY		
12-1554		Tuning Shaft Bracket		.02
26-420		Dial Scale		.90
46-785		Tuning & Vol. Control Knob (2 Used)		.10
57-1490		Emblem Plate		.40
57-1493		Trim Plate		1.40
57-1513		Emblem Plate (Y Model only)		.40
57-1514		Trim Plate (Y Model only)		1.60
76-540		Tuning Shaft		.10
80-209		Dial Cord Tension Spring (3 Used)		.024
93-978		Felt Washer (Used behind Pointer Assem.)		.005
188-32		Retaining Ring (Used on 76-540)		1.03C
S-15430		Pointer & Pulley Assem.		.15
S-15440		Dial Cord Assem. (Short)		.05
S-15441		Dial Cord Assem. (Long)		.10
S-16016		Dial Cord Assem. (Long)		.10
		COILS & CHOKES		
95-1132	T1	1st. I. F. Transformer		1.60
95-1133	T2	2nd. I. F. "		1.60
S-15429	L2	Osc. Coil Assem.		.75
		CONDENSERS		
22-3	C9	.01 Mfd. (Ceramic Disc.)	500V	.26
22-182	C5	220 Mmfd. (Molded Mica)	500V	.26
22-326	C11	.003 Mfd.	400V	.20
22-492	C7	.002 "	600V	.20
22-826	C4	.01 "	200V	.20
22-827	C6	.1 "	200V	.23
22-829	C17	.05 "	200V	.20
22-1386	C10	.02 "	200V	.20
22-1669	C8	100 Mmfd.	500V	.20
22-1741	C13,14 15 & 16	Four Section Electrolytic		3.50
22-1775	C12	.047 Mfd. (Molded) (or 22-1914)	400V	.26
22-2032	C1	Two Section Gang		2.90
22-2108	C1	Two Section Gang		
		RESISTORS		
63-1719	R15	27 Ohm 1/2W 10% Ins.		.21
63-1761	R3	270 " 1/2W 10% Ins.		.21
63-1771	R4	470 " 1/2W 10% Ins.		.21
63-1778	R7	680 " 1/2W 10% Ins.		.21
63-1841	R6	22K " 1/2W 10% Ins.		.21
63-1870	R1	100K Ohm 1/2W " "		.21
63-1912	R12	1 Meg Ohm 1/2W 20% Ins.		.21
63-1933	R14	3.3 Meg Ohm 1/2W 20% Ins.		.21
63-1940	R13	4.7 " " 1/2W 20% "		.21
63-1954	R2	10 " " 1/2W 20% "		.21
63-1961	R11	15 " " 1/2W 20% "		.21
63-1999	R8	140 Ohm 3W 10% (Zipohm) Ins. (or 63-2014)		.33
63-2010	R9,10	Two Section Candohm		.60
63-2013	R5	Volume Control		1.20
		MISCELLANEOUS		
11-104		Line Cord & Plug		.65
12-1553		Chassis Mtg. Brkt. (2 Used)		.05
14-1103		Cabinet for 4G903 (Use S-15427)		
14-1103Y		Cabinet for 4G903Y (Use S-15631)		
15-51		Cable Socket Cap & Insulator		.09
19-99		Coil Mtg. Clip		.03
19-185		Speaker Baffle Retaining Clip (2 Used)		.03
24-481		Front Door		1.15
24-482		On-Off Switch Cover		.10
24-495		Front Door (Y Model only)		1.15
49-658	SP-1	4" P.M. Speaker		7.00
		208-658 Cone & Voice Coil		1.73
		206-658 Output Trans.		1.67
54-30		#8-32 X 5/16" X 7/64" Hex Nut Steel N.P.		.31C
54-34		#6-32 X 1/4" X 3/32 Hex Nut - Steel N.P. (Used on Rectifier)		.31C
54-139		#3/8-32 X 9/16" Palnut-Type 9N Cad. Pl. (Used on Vol. Control)		.008
54-267		#6-32 X 5/16 Palnut Cad. Pl. (2 Used on I. F. Trans.)		.45C
54-282		Spring Nut-Cad. Pl. (2 Used on Dial Scale & Pointer)		.01
54-283		Spring Nut Black Oxide (3 Used)		.01
54-284		Wavemagnet Lead Retaining Nut (2 Used)		.02
57-1480		Chassis Bottom Plate (Metal)		.50
57-1491		Latch Plate (Behind Latch)		.01
57-1494		Cabinet Reinforcing Plate		.20
61-71		Idler Pulley (6 Used)		.02
61-136		Idler Pulley (Black)		.07
64-288		Shoulder Rivet (2 Used on S-15595)		.02
64-290		Shoulder Rivet (1 Used on 61-71)		.015
64-303		Shoulder Rivet (1 Used on S-15433)		.015
78-274		Elect. Cond. Socket		.03
78-543		Battery Cable Socket (4 Contact)		.13
78-782		Miniature Tube Socket		.25
78-806		Miniature Tube Socket		.15
78-807		Miniature Tube Socket (2 Used)		.15
80-699		Latch Spring		.03
83-1600		Handle Strip (Slotted)		.20
83-1610		Wavemagnet Retaining Strip (2 Used)		.015
85-450	S1	Power Change-Over Switch		1.00
85-451	S2	On-Off Switch		.55
94-472		Handle Mtg. Bushing (2 Used)		.18
112-761		#2 X 1/4" Phill. R.H.S.T. Type Z Steel N.P. (2 Used on Emblem Plate)		.02
113-18		#6-32 X 5/16 Hex. Hd. Slotted M.S. Steel Cad. Pl. Shakeprf. (2 Used on 85-450)		.02
113-23		#8-32 X 5/16 Hex Hd. Sl. M.S. Steel Cad. Pl. Int. Shakeprf. Lock (2 Used on S-15633)		.02
114-159		#6 X 1/4" Hex Hd. S.T. Screw Cad. Pl. (4 Used on S-15437)		.72C
114-311		#6-32 X 1" Hex Hd. Slotted M.S. Steel N.P. (1 Used to Mt. Rectifier		.02
114-319		#8-32 X 11/16" Hex Hd. Slotted M.S. Steel Cad. Pl. (2 Used to Mt. Handle)		.015
147-156		Speaker Mtg. Spacer		.02
156-37		Door Latch		.25
156-38		Rear Cover Catch (2 Used-Black)		.02
156-39		Door Latch (Y Model only)		.30
166-44		Rubber Bumper (Speaker & Gang)		.02
192-124		Dial Glass		.60
199-115		Flexible Handle Sleeve (With Cardboard Strips)		.40
199-116		Paper Sleeve (Used on Wavemagnet Lead)		.015
202-689		Instruction Book		.10
212-5	SE-1	Selenium Rectifier (or 212-2)		1.80
S-15427		Cabinet Front & Hinge Assem.		4.50
S-15433		Support Brkt. & Idler Pulley Assem. (Gang & Door)		.45
S-15434		Wavemagnet Winding Assem.		.70
S-15438	W1	Battery Cable & Socket Assem.		.50
S-15473		Speaker Baffle & Grille Cloth Assem. (110-137)		.25
S-15548		Cabinet Rear Cover Assem.		3.00
S-15549		Handle End Pieces Assem. (2 Used)		1.50
S-15595		Brkt. & Idler Pulley Assem. (Lower)		.15
S-15631		Cabinet Front & Hinge Assem. (Y Model only)		4.50
S-15632		Cabinet Rear Cover Assem. (Y Model only)		3.00
S-15633		Handle End Pieces Assem. (Y Model only)		1.50

Prices subject to change without notice.

MISCELLANEOUS

		Cabinet Back	.30
02		Cabinet Back (6R880GO only)	.35
70		Line Cord Plug - 7 ft.	.65
15		Tone Control Mounting Bracket	.15
50		Shield Support Bracket	.02
02		Record Changer Mounting Clip (4 used)	.10
03		Tuning & Volume Control Knob	.10
17		Tone Control Knob	.12
11		Phono Switch Knob	.10
03C	SP-1	P. M. Speaker (5 1/4")	4.75
20C		208-602 Cone & Voice Coil	1.73
04		#8-32 X 5/16" Hex Nut Steel N.P. (2 used)	.31C
05		#3/8 - 32 X 9/16" Palnut Type 9N -Steel Cad. (2 used)	.01
15		Speed Nut	.03
50		Speed Nut (Used on 26-387)	.75C
		#6-32 X 5/16" Hex Palnut - Inverted Type (4 used)	.45C
		Wavemagnet Lead Spacer Strip	.02
		Dial Escutcheon	4.00
		Chassis Cover Plate	.75
15		#6 X 5/16" Phillips Rd. Hd. Wood Screw-Steel - Statuary Bronze (7 used)	.01
50			
75		#5 X 3/8" Washer Hd. Wood Screw-Steel-Statuary Bronze (6 used) (Cabinet Back Mtg.)	.01
75			
		#4 X 3/8" Phillips Flat Hd Wood Screw-Steel Brass Plate (Escutcheon Mtg.)	.02
		Socket - Electrolytic Capacitor	.03
		Socket - Miniature Tube	.19
10	P-1	Socket - Phono (5 contact)	.15
10		Socket - Octal Tube (2 used)	.15
10		Socket Miniature Tube (7 contact)	.20
10		Socket - Miniature Tube (7 contact) (2 used)	.20
10		Record Changer Mounting Spring (4 used)	.02
10		Tone Arm Support	.10
10	S-1	Phono - Radio Switch (or 85-438)	.90
16	S-2	Reject Switch	.40
13		#6 Int. Shakeproof Lockwasher (4 used)	.31C
10		#8 Int. Shakeproof Lockwasher (2 used)	.36C
10		Felt Washer (2 used)	.01
18		Capacitor Mounting Bushing (5 used)	.04
10	T-3	Output Transformer	1.65
10		Grille Cloth	.25
10		Record Changer Mounting Screw (4 used)	.11
10		#6 X 7/16" Straight Binding Hd. Wood Screw Steel Statuary Bronze (8 used)	.85C
10		#6-32 X 3/8" Hex Acorn Hd. M.S. Steel N.P. (2 used)	.43C
10		#6-32 x 7/16" Hex Acorn Hd. M. S. Steel N.P. (3 used)	.43C
		#10 X 1 1/16" Hex Washer Hd. Self Tapping Screw	1.81C
		#8 X 1/4" Hex Hd. Slotted Self Tapping Screw-Cad (9 used)	.75C
		#8-32 X 7/16" Hex Hd. Slotted M. Screw - Steel N.P.	.85C
		Rubber Grommet (5 used)	.03
11		Rubber Grommet (2 used)	.05
11		Speaker Baffle	.40
14		Rubber Bumper (or 166-41)	.02
14		Instruction Book (Phono & Chassis)	.10
11	L-1	Wavemagnet Assembly - Type 26 FR	1.25
10		Non-Intermixer Record Changer	
11		Hinge Assembly	1.85
11			
11		PRICES SUBJECT TO CHANGE WITHOUT NOTICE	
11		Z.R.C. 9/8/48	
11			
11			
11			
11			
11			

TO THE SERVICE MAN:

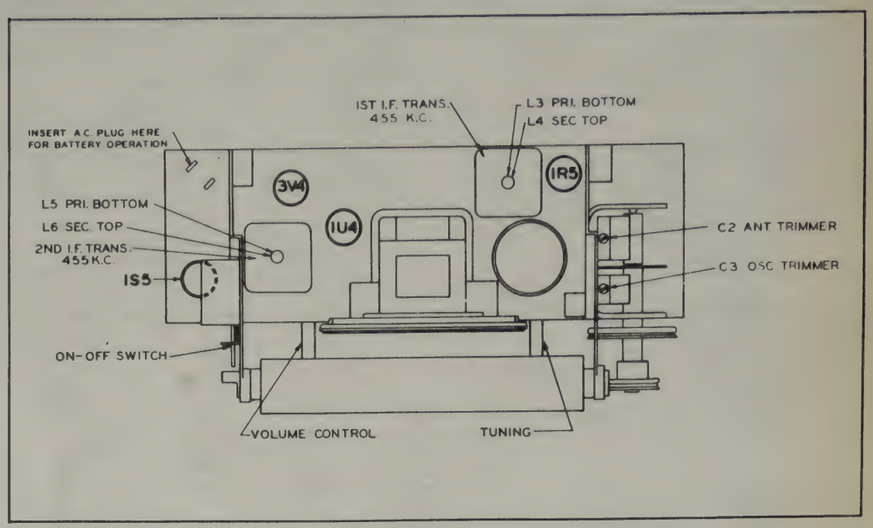
The 4F40 chassis is an AC, DC or battery operated superheterodyne. The chassis is isolated from the DC circuit, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the terminal strip to which C17 is connected. When the change over Switch S1 is in AC position, the DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will result. Microphonic tubes will cause audio howl. Check the 1R5 and 1S5.

The wavemagnet is connected to the chassis by two wires that pass through the hollow dial pivots. If the R.F. becomes weak or dead, check the D.C. resistance of the wavemagnet. This D.C. resistance should be approximately .9 ohm. If it is open check the wavemagnet.

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the wavemagnet can be connected. All the connections and adjustments can be made from the top of the chassis. Connect a signal generator, through a .1 mfd. dummy antenna, to the converter grid and B - (common return). Connect an output meter across the voice coil of the speaker (two lugs provided). Set the signal generator to 455 Kc. and adjust L3, L4, L5 and L6 for maximum indication on the output meter. Always keep the signal output from the generator just high enough to get an indication, otherwise excessive loading may result.

RF Alignment: Connect a two turn loop across the leads of the signal generator, loosely couple this loop to the wavemagnet. Set the signal generator and the dial pointer of the receiver to 1600 Kc. and adjust C3 oscillator trimmer to resonance. Set the signal generator and dial pointer to 1400 and adjust C2 antenna trimmer to resonance. These trimmers are on the top of gang condenser. Check operation and re-install set in cabinet. Tune in a weak station near 1400 Kc. or use background noise and readjust antenna trimmer for maximum sensitivity.

TUBE, TRIMMER LOCATION

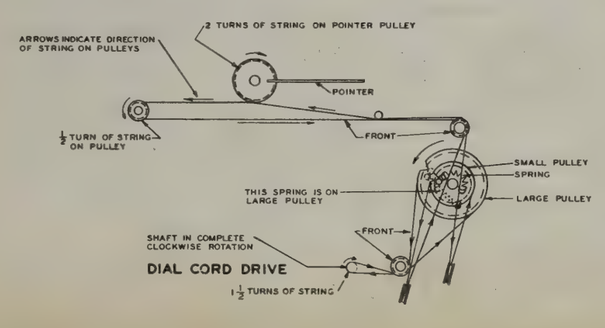


ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL TO	TRIMMERS	PURPOSE
1	Converter Grid	.1 Mfd	455 Kc.	BC	600 Kc.	L3,4, 5& 6	I.F. Alignment
2	Two turns loosely coupled to Wavemagnet		1600 Kc.	BC	1600 Kc.	Osc. Trim. C3	Set Oscillator to scale
3	Two turns loosely coupled to Wavemagnet		1400 Kc.	BC	1400 Kc.	Ant. Trim. C2	Align Wavemagnet

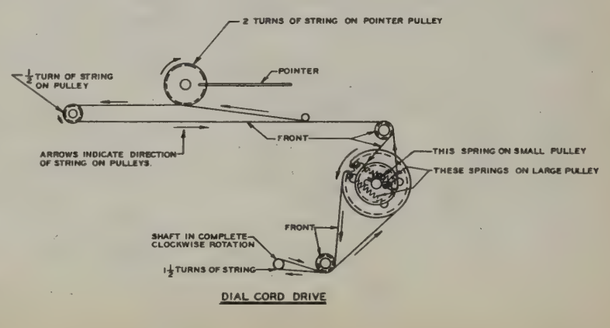
365

DIAL CABLE DRAWING



On receivers using Tuning Gang #22-2032, Dial String Assemblies #S-15440 (short) and #S-15441 (long) must be used.

DIAL CABLE DRAWING


2 TURNS OF STRING ON POINTER PULLEY
½ TURN OF STRING ON PULLEY
POINTER
FRONT
ARROWS INDICATE DIRECTION OF STRING ON PULLEYS.
THIS SPRING ON SMALL PULLEY
THESE SPRINGS ON LARGE PULLEY
FRONT
SHAFT IN COMPLETE CLOCKWISE ROTATION
1½ TURNS OF STRING
DIAL CORD DRIVE

On receivers using Tuning Gang #22-2108, Dial String Assemblies #S-15440 (short) and #S-16106 (long) must be used.

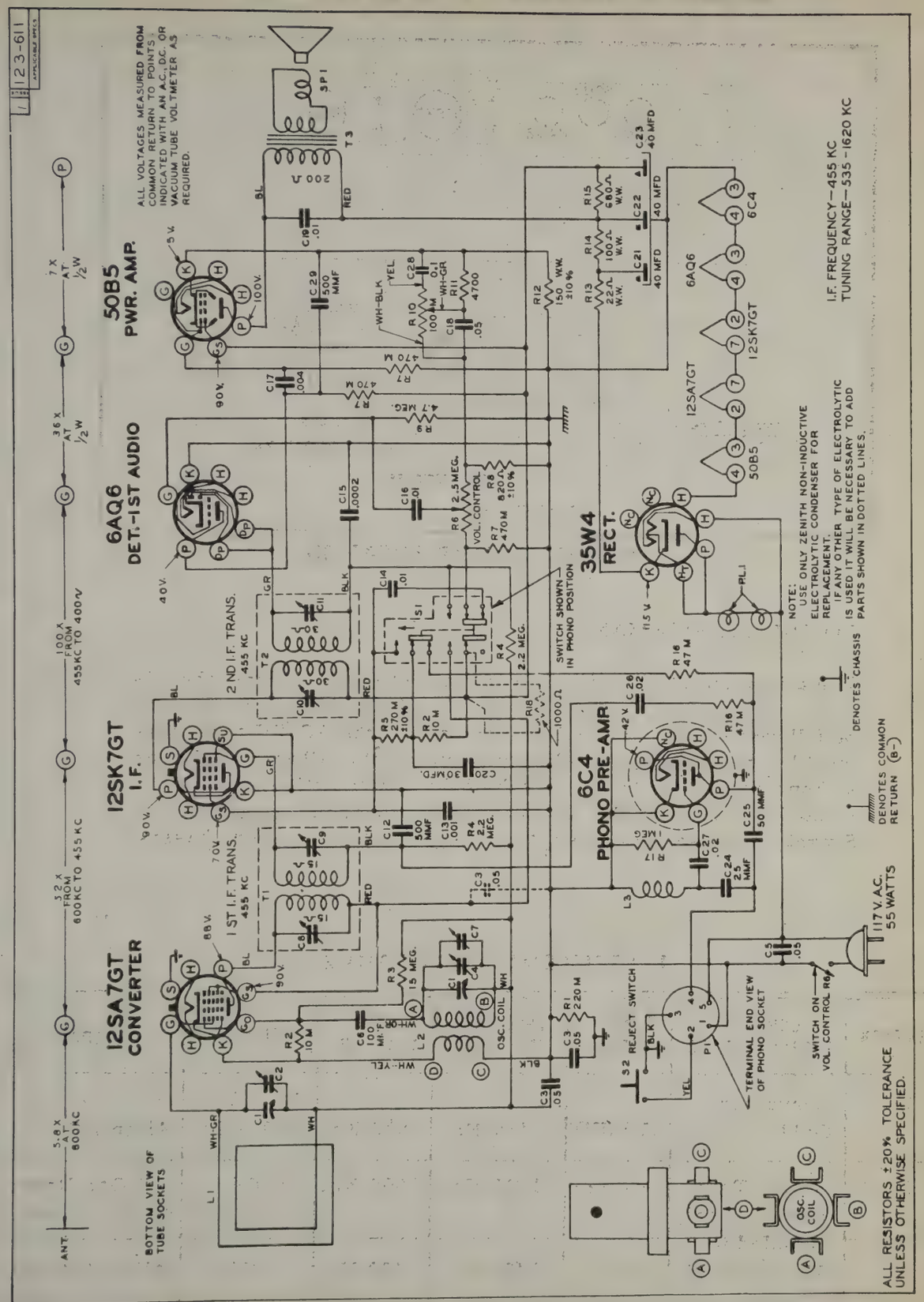
366

PARTS LIST

PART NO.	REF.NO.	DESCRIPTION		PRICE
		DIAL ASSEMBLY		
12-1554		Tuning Shaft Bracket		.02
26-420		Dial Scale		.90
46-785		Tuning & Vol. Control Knob (2 Used)		.10
57-1490		Emblem Plate		.40
57-1493		Trim Plate		1.40
57-1513		Emblem Plate (Y Model only)		.40
57-1514		Trim Plate (Y Model only)		1.60
76-540		Tuning Shaft		.10
80-209		Dial Cord Tension Spring (3 Used)		.024
93-978		Felt Washer (Used behind Pointer Assem.)		.005
188-32		Retaining Ring (Used on 76-540)		1.03C
S-15430		Pointer & Pulley Assem.		.15
S-15440		Dial Cord Assem. (Short)		.05
S-15441		Dial Cord Assem. (Long)		.10
S-16016		Dial Cord Assem. (Long)		.10
		COILS & CHOKES		
95-1132	T1	1st. I. F. Transformer		1.60
95-1133	T2	2nd. I. F. " "		1.60
S-15429	L2	Osc. Coil Assem.		.75
		CONDENSERS		
22-3	C9	.01 Mfd. (Ceramic Disc.)	500V	.26
22-182	C5	220 Mmfd. (Molded Mica)	500V	.26
22-326	C11	.003 Mfd.	400V	.20
22-492	C7	.002 "	600V	.20
22-826	C4	.01 "	200V	.20
22-827	C6	.1 "	200V	.23
22-829	C17	.05 "	200V	.20
22-1386	C10	.02 "	200V	.20
22-1669	C8	100 Mmfd.	500V	.20
22-1741	C13,14 15 & 16	Four Section Electrolytic		3.50
22-1775	C12	.047 Mfd. (Molded) (or 22-1914)	400V	.26
22-2032	C1	Two Section Gang		2.90
22-2108	C1	Two Section Gang		
		RESISTORS		
63-1719	R15	27 Ohm 1/2W 10% Ins.		.21
63-1761	R3	270 " 1/2W 10% Ins.		.21
63-1771	R4	470 " 1/2W 10% Ins.		.21
63-1778	R7	680 " 1/2W 10% Ins.		.21
63-1841	R6	22K " 1/2W 10% Ins.		.21
63-1870	R1	100K Ohm 1/2W " "		.21
63-1912	R12	1 Meg Ohm 1/2W 20% Ins.		.21
63-1933	R14	3.3 Meg Ohm 1/2W 20% Ins.		.21
63-1940	R13	4.7 " " 1/2W 20% "		.21
63-1954	R2	10 " " 1/2W 20% "		.21
63-1961	R11	15 " " 1/2W 20% "		.21
63-1999	R8	140 Ohm 3W 10% (Zipohm) Ins. (or 63-2014)		.33
63-2010	R9,10	Two Section Candohm		.60
63-2013	R5	Volume Control		1.20
		MISCELLANEOUS		
11-104		Line Cord & Plug		.65
12-1553		Chassis Mtg. Brkt. (2 Used)		.05
14-1103		Cabinet for 4G903 (Use S-15427)		
14-1103Y		Cabinet for 4G903Y (Use S-15631)		
15-51		Cable Socket Cap & Insulator		.09
19-99		Coil Mtg. Clip		.03
19-185		Speaker Baffle Retaining Clip (2 Used)		.03
24-481		Front Door		1.15
24-482		On-Off Switch Cover		.10
24-495		Front Door (Y Model only)		1.15
49-658	SP-1	4" P.M. Speaker		7.00
		208-658 Cone & Voice Coil		1.73
		206-658 Output Trans.		1.67
54-30		#8-32 X 5/16" X 7/64" Hex Nut Steel N.P.		.31C
54-34		#6-32 X 1/4" X 3/32 Hex Nut - Steel N.P. (Used on Rectifier)		.31C
54-139		#3/8-32 X 9/16" Palnut-Type 9N Cad. Pl. (Used on Vol. Control)		.008
54-267		#6-32 X 5/16 Palnut Cad. Pl. (2 Used on I. F. Trans.)		.45C
54-282		Spring Nut-Cad. Pl. (2 Used on Dial Scale & Pointer)		.01
54-283		Spring Nut Black Oxide (3 Used)		.01
54-284		Wavemagnet Lead Retaining Nut (2 Used)		.02
57-1480		Chassis Bottom Plate (Metal)		.50
57-1491		Latch Plate (Behind Latch)		.01
57-1494		Cabinet Reinforcing Plate		.20
61-71		Idler Pulley (6 Used)		.02
61-136		Idler Pulley (Black)		.07
64-288		Shoulder Rivet (2 Used on S-15595)		.02
64-290		Shoulder Rivet (1 Used on 61-71)		.015
64-303		Shoulder Rivet (1 Used on S-15433)		.015
78-274		Elect. Cond. Socket		.03
78-543		Battery Cable Socket (4 Contact)		.13
78-782				
78-806				
78-807				
80-699				
83-1600				
83-1610				
85-450	S1			
85-451	S2			
94-472				
112-761				
113-18				
113-23				
114-159				
114-311				
114-319				
147-156				
156-37				
156-38				
156-39				
166-44				
192-124				
199-115				
199-116				
202-689				
212-5	SE-1			
S-15427				
S-15433				
S-15434				
S-15438	W1			
S-15473				
S-15548				
S-15549				
S-15595				
S-15631				
S-15632				
S-15633				
		MISCELLANEOUS		
		Miniature Tube Socket		.25
		Miniature Tube Socket		.15
		Miniature Tube Socket (2 Used)		.15
		Latch Spring		.03
		Handle Strip (Slotted)		.20
		Wavemagnet Retaining Strip (2 Used)		.015
		Power Change-Over Switch		1.00
		On-Off Switch		.55
		Handle Mtg. Bushing (2 Used)		.18
		#2 X 1/4" Phill. R.H.S.T. Type Z Steel N.P. (2 Used on Emblem Plate)		.02
		#6-32 X 5/16 Hex. Hd. Slotted M.S. Steel Cad. Pl. Shakeprf. (2 Used on 85-450)		.02
		#8-32 X 5/16 Hex Hd. Sl. M.S. Steel Cad. Pl. Int. Shakeprf. Lock (2 Used on S-15633)		.02
		#6 X 1/4" Hex Hd. S.T. Screw Cad. Pl. (4 Used on S-15437)		.72C
		#6-32 X 1" Hex Hd. Slotted M.S. Steel N.P. (1 Used to Mt. Rectifier		.02
		#8-32 X 11/16" Hex Hd. Slotted M.S. Steel Cad. Pl. (2 Used to Mt. Handle)		.015
		Speaker Mtg. Spacer		.02
		Door Latch		.25
		Rear Cover Catch (2 Used-Black)		.02
		Door Latch (Y Model only)		.30
		Rubber Bumper (Speaker & Gang)		.02
		Dial Glass		.60
		Flexible Handle Sleeve (With Cardboard Strips)		.40
		Paper Sleeve (Used on Wavemagnet Lead)		.015
		Instruction Book		.10
		Selenium Rectifier (or 212-2)		1.80
		Cabinet Front & Hinge Assem.		4.50
		Support Brkt. & Idler Pulley Assem. (Gang & Door)		.45
		Wavemagnet Winding Assem.		.70
		Battery Cable & Socket Assem.		.50
		Speaker Baffle & Grille Cloth Assem. (110-137)		.25
		Cabinet Rear Cover Assem.		3.00
		Handle End Pieces Assem. (2 Used)		1.50
		Brkt. & Idler Pulley Assem. (Lower)		.15
		Cabinet Front & Hinge Assem. (Y Model only)		4.50
		Cabinet Rear Cover Assem. (Y Model only)		3.00
		Handle End Pieces Assem. (Y Model only)		1.50

Prices subject to change without notice.

MODEL 6R880 CHASSIS 6E03


123-611
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C. D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
50B5 PWR. AMP.
6AQ6 DET.-1ST AUDIO
35W4 RECT.
12SK7GT I.F.
12SA7GT CONVERTER
6C4 PHONO PRE-AMR
6AQ6
6C4
12SA7GT
12SK7GT
50B5
I.F. FREQUENCY—455 KC
TUNING RANGE—535 - 1620 KC
NOTE: USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT. IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.
SWITCH SHOWN IN PHONO POSITION
2ND I.F. TRANS. 455 KC
1ST I.F. TRANS. 455 KC
OSC. COIL
REJECT SWITCH
TERMINAL END VIEW OF PHONO SOCKET
SWITCH ON VOL. CONTROL R6
117 V. A.C. 55 WATTS
DENOTES CHASSIS
DENOTES COMMON RETURN (B-)
BOTTOM VIEW OF TUBE SOCKETS
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

PARTS LIST

DIAL ASSEMBLY

12-1383		Dial Light Bracket (2 used)
26-387		Dial Scale
76-492		Tuning Control Shaft
78-769		Dual Dial Light Socket & Wire
80-69		Dial Cord Tension Spring
80-209		Dial Cord Tension Spring
97-284		Dial Cord Guide Stud
100-90	PL-1	Dial Light Bulb (2 used)
188-32		Retaining Ring
188-34		Retaining Ring
S-13827		Dial Cord Assembly (Short)
S-13828		Dial Cord Assembly (Long)
S-13830		Tuning Pulley & Bushing Assembly
S-14667		Dial Pointer & Pulley Assembly (59-214)

COIL & CHOKES

95-906	T-2	2nd I. F. Transformer
95-919	T-1	1st I. F. Transformer
S-12603	L-3	Phono Oscillator Coil Assembly (FM-Phono)
S-13799	L-2	Oscillator Coil Assembly

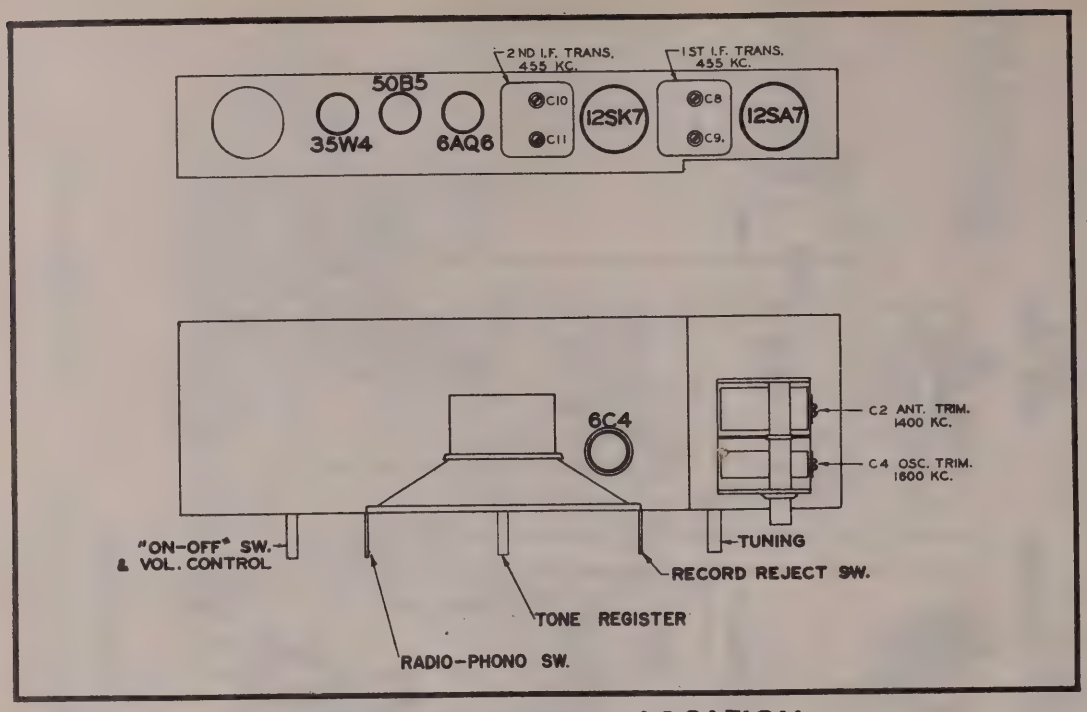
CONDENSERS

22-162	C-6	.0001 MFD (or 22-1669)	500 V.
22-178	C-18	.05 MFD	200 V.
22-188	C-26	.02 MFD	400 V.
22-196	C-16	.01 MFD	600 V.
22-243	C-14	.01 MFD	400 V.
22-327	C-27	.02 MFD	200 V.
22-448	C-17	.004 MFD	600 V.
22-716	C-29	.0005 MFD	500 V.
22-827	C-28	.1 MFD	200 V.
22-829	C-3	.05 MFD	200 V.
22-854	C-12	.0005 MFD	600 V.
22-953	C-15	.0002 MFD (or 22-1668)	500 V.
22-1017	C-5	.05 MFD	400 V.
22-1182	C-19	.01 MFD	400 V.
22-1444	C-13	.001 MFD	200 V.
22-1532	C-25	50 MMFD (or 22-1674)	500 V.
22-1657	C-1	Two Gang Variable	
22-1707	C20,21,22,23	Dry Electrolytic 40-40-40-30 MFD	150 V.
22-1758	C-24	25 MMFD Ceramic	500 V.

RESISTORS

63-686	R-12	150 ohm W. W.		1 W.
63-1219	R-13	22 ohm W. W.		1 W.
63-1220	R-14	100 ohm W. W.		1 W.
63-1221	R-15	680 ohm W. W.		1 W.
63-1555	R-6	Volume Control & Switch		
63-1653	R-10	Tone Control		
63-1782	R-8	820 ohm	(Insulated)	½ W.
63-1814	R-11	4700 ohm	(Insulated)	½ W.
63-1828	R-2	10 M ohm	(Insulated)	½ W.
63-1856	R-16	47 M ohm	(Insulated)	½ W.
63-1884	R-1	220 M ohm	(Insulated)	½ W.
63-1887	R-5	270 M ohm	(Insulated)	½ W.
63-1898	R-7	470 M ohm	(Insulated)	½ W.
63-1911	R-17	1 Megohm	(Insulated)	½ W.
63-1926	R-4	2.2 Megohm	(Insulated)	½ W.
63-1940	R-9	4.7 Megohm	(Insulated)	½ W.
63-1961	R-3	15 Megohm	(Insulated)	½ W.

MODELS 6R880 CHASSIS 6E03



TUBE AND TRIMMER LOCATION

TO THE SERVICEMAN:

The alignment of chassis 6E03 is conventional, however the adjustments interlock to some degree, therefore, the procedure must be followed exactly. Since this chassis is of the AC/DC type, care must be exercised when making measurements. Chassis 6E03 has a phono-radio push button switch of the double acting type. When in the "In" position this connects the radio for playing records. Socket P1 is used to connect the changer to the receiver chassis.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 MFD	455 Kc.	600 Kc.	C8, C9, C10, C11	Align I.F.
2	Single Turn Loop Loosely Coupled to Wavemagnet	-------	1600 Kc.	1600 Kc.	C4	Set Oscillator to Dial Scale.
3		-------	1400 Kc.	1400 Kc.	C2	Align Antenna.

MODEL 6R980LP-6R980RLP-6R980GOLP
(Chassis 6E03)

Part No.	Description	Price

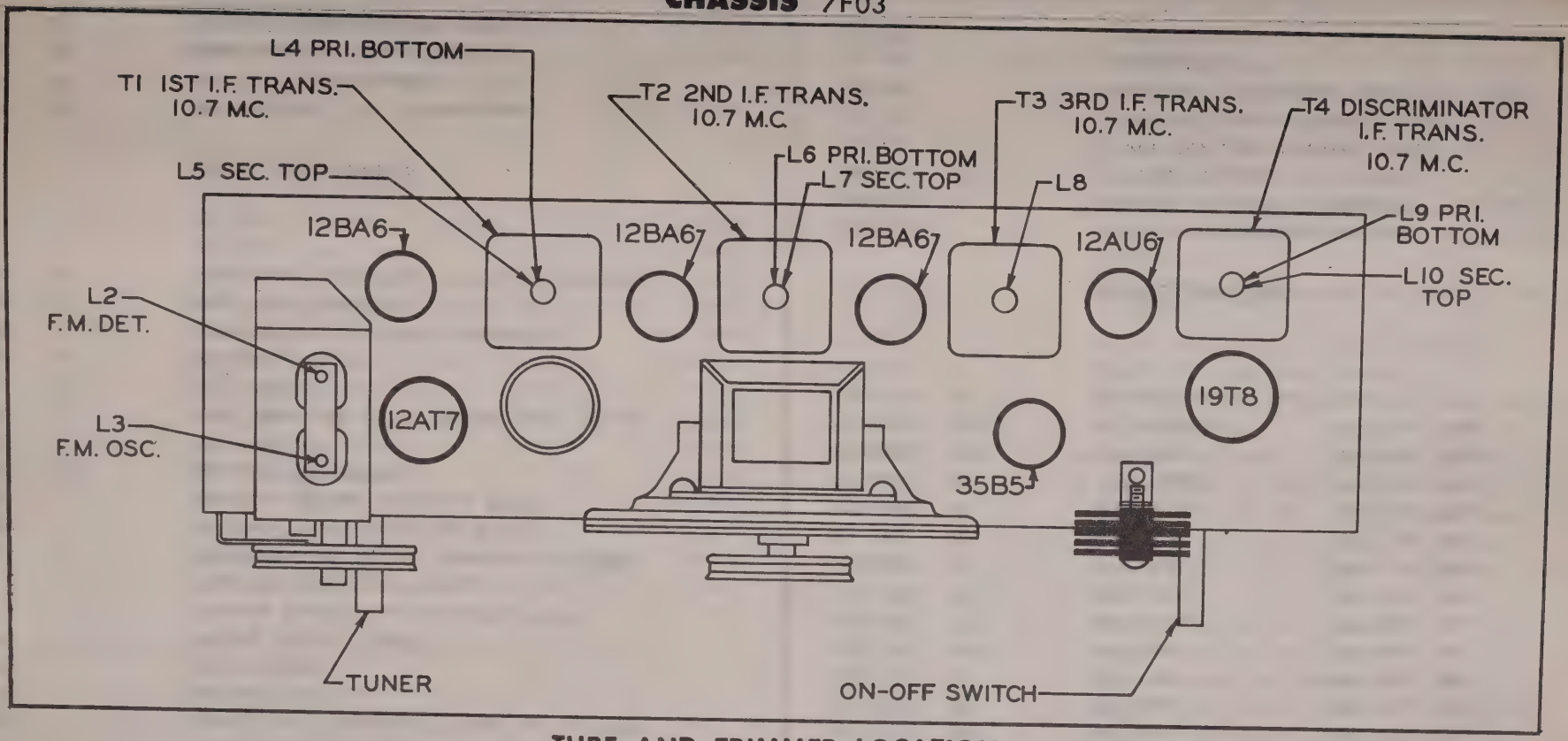
6R980LP-6R980RLP-6R980GOLP are the same as 6R880 - 6R880R - 6R880GO except the following:

OMIT:

S-14007	Record Changer
202-662	Instruction Book (Phono & Radio)
57-1402	Chassis Cover Plate
80-407	Record Changer Mtg. Spring (4 used)

ADD:

S-14014	Dual Speed Record Changer	
202-688	Instruction Book (Phono & Radio)	.15
57-1478	Chassis Cover Plate	.60
80-463	Record Changer Mtg. Spring (4 used)	.03



TUBE AND TRIMMER LOCATION

To The Service Man:

The 7F03 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band. There is one stage of RF amplification on the FM Band.

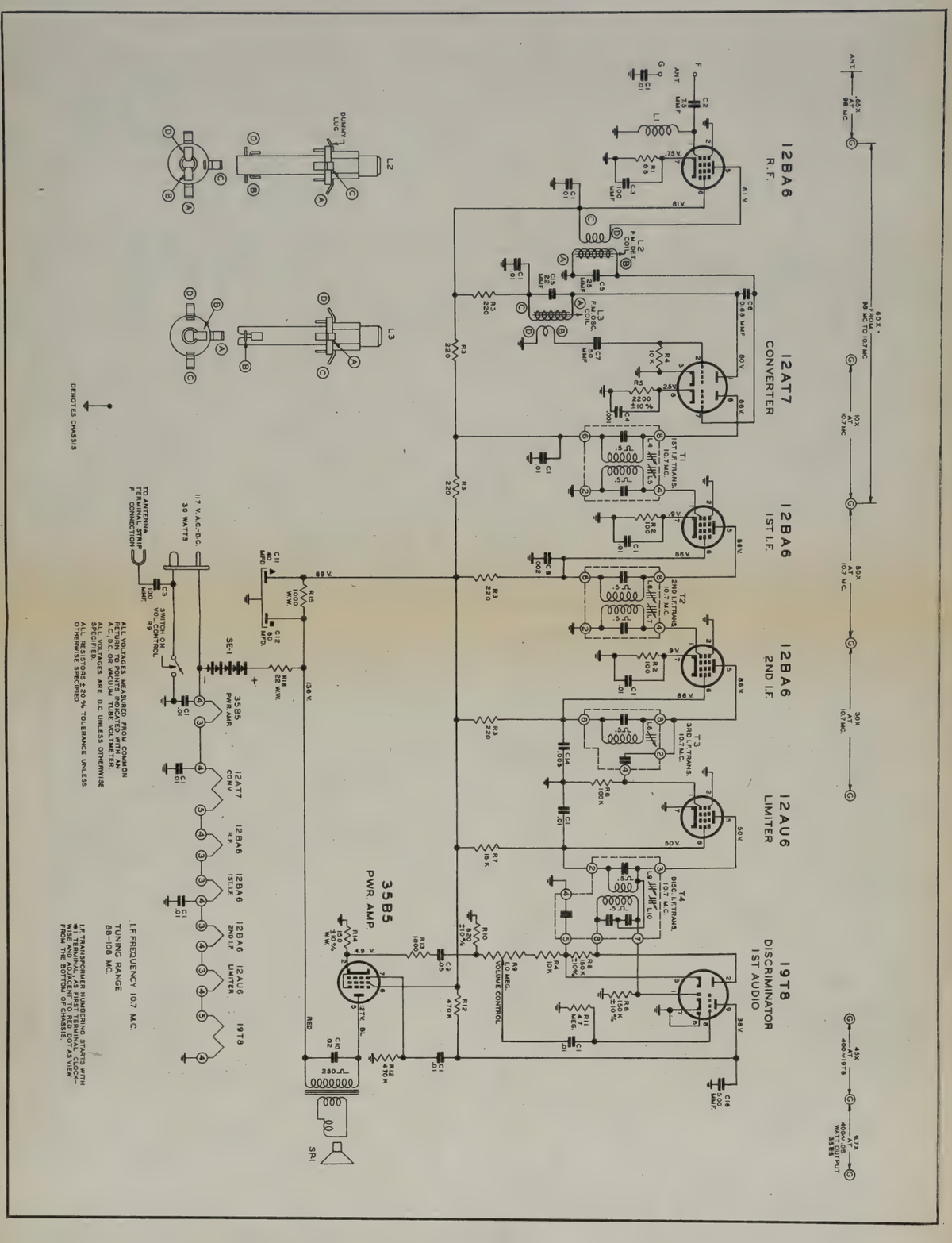
When adjustments are made on the 7F03 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

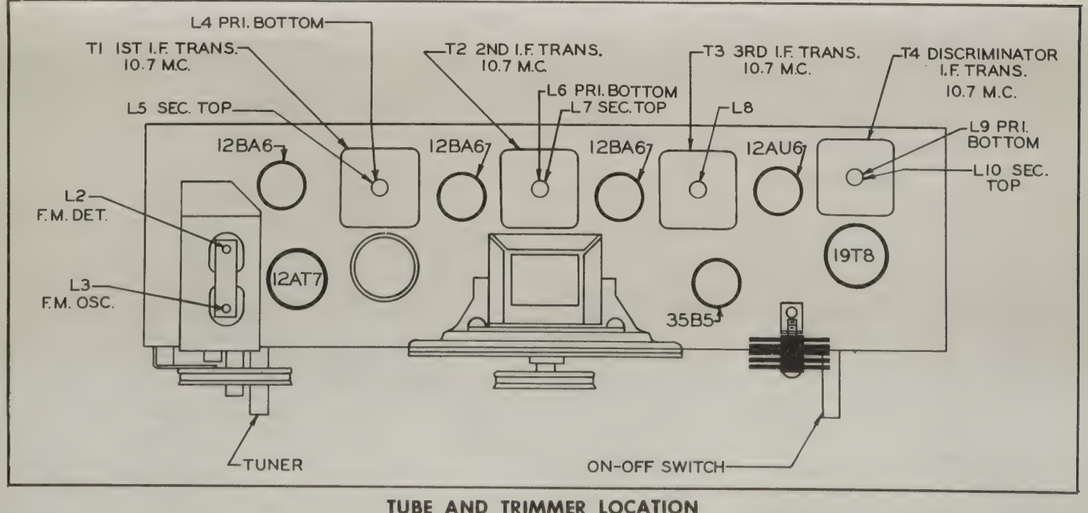
RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

IF Alignment: The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.


12BA6 R.F.
12AT7 CONVERTER
12BA6 1ST I.F.
12BA6 2ND I.F.
12AU6 LIMITER
19T8 DISCRIMINATOR 1ST AUDIO
35B5 PWR. AMP.
T1 1ST I.F. TRANS. 10.7 MC.
T2 2ND I.F. TRANS. 10.7 MC.
T3 3RD I.F. TRANS. 10.7 MC.
T4 DISC. I.F. TRANS. 10.7 MC.
L1
L2 F.M. DET.
L3 F.M. OSC. COIL
117 V. A.C.-D.C. 30 WATTS
SPKR.
DENOTES CHASSIS
I.F. FREQUENCY 10.7 M.C.
TUNING RANGE 88-108 MC.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C.-D.C. OR VACUUM TUBE VOLTMETER. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ± 20 % TOLERANCE UNLESS OTHERWISE SPECIFIED.



TUBE AND TRIMMER LOCATION

To The Service Man:

The 7F03 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7F03 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

IF Alignment: The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1 (a)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L9 coil slug Primary discr.	Align primary of discriminator for maximum reading.
2 (b)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
3 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L8 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
4 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 2nd IF trans.	Align 2nd IF transformer for maximum reading.
5 (c)	Pin 7 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L4 and L5 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
6 (c) (d)	Antenna Post FM (Remove line ant)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Osc. Coil Slug	Set Oscillator to dial scale
7 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L2 Det. Coil Slug	Align det. stage to maximum reading.

372

IMPORTANT

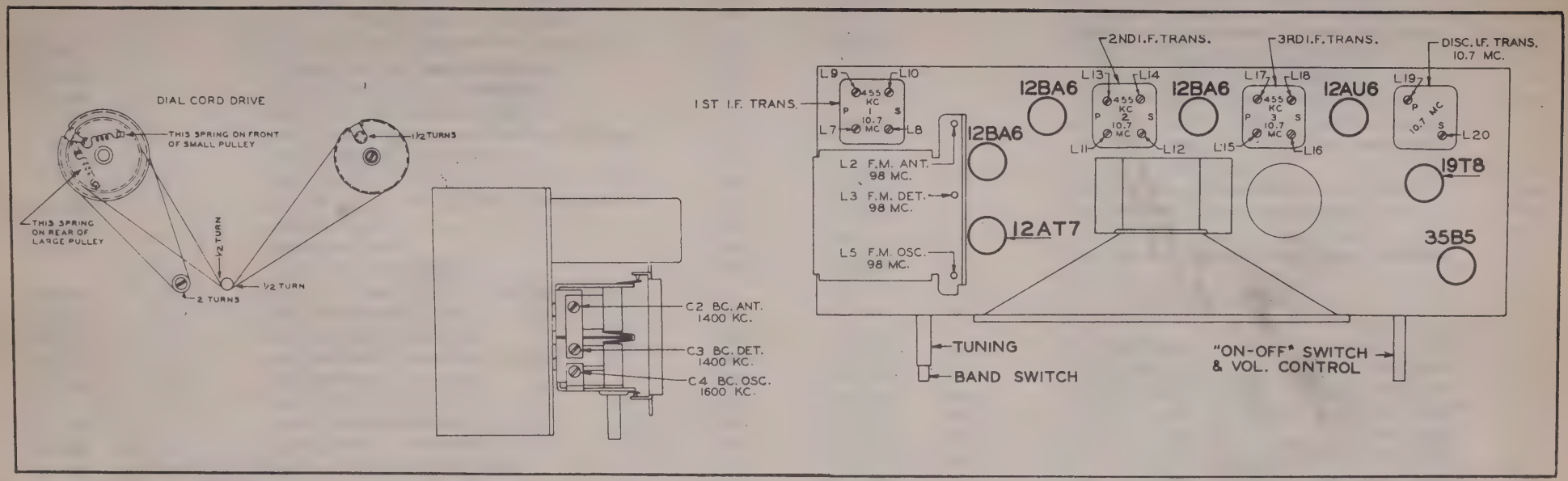
Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7F01 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

When adjustments are made on the 7F01 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

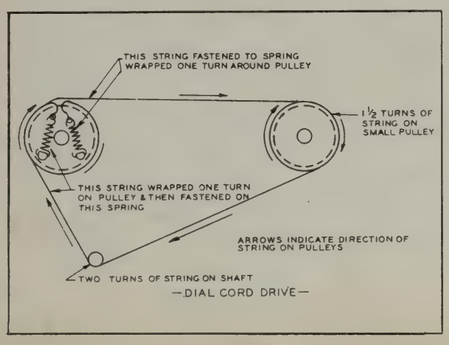
FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION
		DIAL ASSEMBLY
12-1605		Tuner Mounting Bracket.
26-423		Dial Scale & Escutcheon
46-805		Volume Control and Tuning Knob (2 used)
54-292		Speed Nut (Tinnerman) (Used on S-15686)
57-1522		Emblem Plate.
59-228		Dial Pointer.
76-549		Tuning Control Shaft.
76-552		Tension Shaft (used with S-15745)
80-402		Dial Cord Tension Spring.
80-721		Shaft Tension Spring (used on S-15745).
83-1634		Pointer Pulley Mounting Strip
93-992		Bakelite Washer (used on dial).
94-670		Tuner Shaft Bushing
110-139		Grill Cloth
114-39		#8x¼" Hex. Hd. S. T. Screw (used to mt. 12-1605).
188-32		Retaining Ring.
S-15686		Pointer Pulley & Shaft Assembly
S-15688		Dial Cord Assembly.
S-15745		Iron Core Drive Shaft & Pulley Assembly
		COILS AND CHOKES
95-1150	T1	1st and 2nd I. F. Transformer
95-1152	T3	3rd I. F. Transformer
95-1153	T4	Discriminator Transformer
S-15690	L1	Antenna Choke Coil Assembly
S-15691	L3	F. M. Oscillator Coil Assembly.
S-15743	L2	F. M. Detector Coil Assembly.
		CONDENSERS
22-3	C1	.01 Mfd. Ceramic. .500V
22-229	C14	.005 Mfd. .600V
22-1158	C9	.05 Mfd. .200V
22-1220	C8	.002 Mfd. .600V
22-1367	C7	50 Mmfd. .500V
22-1379	C10	.02 Mfd. .400V
22-1506	C15	22 Mmfd. Ceramic. .500V
22-1669	C3	.0001 Mfd. Ceramic. .500V
22-1676	C4	.001 Mfd. Ceramic .500V
22-1700	C16	500 Mmfd. Ceramic .500V
22-1757	C11, 12	40 Mfd. - 80 Mfd. Elect. .150V
22-1766	C6	.68 Mmfd. Molded. .500V
22-1852	C2	7.5 Mmfd. Ceramic .500V
22-2060	C5	25 Mmfd. Ceramic .500V


THIS STRING FASTENED TO SPRING WRAPPED ONE TURN AROUND PULLEY
1½ TURNS OF STRING ON SMALL PULLEY
THIS STRING WRAPPED ONE TURN ON PULLEY & THEN FASTENED ON THIS SPRING
ARROWS INDICATE DIRECTION OF STRING ON PULLEYS
TWO TURNS OF STRING ON SHAFT
—DIAL CORD DRIVE—

PART NO.	REF. NO.	DESCRIPTION
		RESISTORS
63-686	R14	150 Ohm (Wirewound) 10% Ins. Res. ½ W.
63-1450	R16	22 Ohm (Wirewound) 20% Ins. Res. 1 W.
63-1527	R15	1000 Ohm (Wirewound) 20% Ins. Res. 3 W.
63-1737	R1	68 Ohm 20% Ins. Res. ½ W.
63-1744	R2	100 Ohm 20% Ins. Res. ½ W.
63-1758	R3	220 Ohm 20% Ins. Res. ½ W.
63-1782	R10	820 Ohm 10% Ins. Res. ½ W.
63-1786	R13	1000 Ohm 20% Ins. Res. ½ W.
63-1799	R5	2200 Ohm 10% Ins. Res. ½ W.
63-1828	R4	10K Ohm 20% Ins. Res. ½ W.
63-1835	R7	15K Ohm 20% Ins. Res. ½ W.
63-1870	R6	100K Ohm 20% Ins. Res. ½ W.
63-1876	R8	150K Ohm 10% Ins. Res. ½ W.
63-1898	R12	470K Ohm 20% Ins. Res. ½ W.
63-1940	R11	4.7 Megohm 20% Ins. Res. ½ W.
63-2035	R9	Volume Control and Switch
		MISCELLANEOUS
12-1612		Rectifier Mounting Bracket.
14-1118		Cabinet for 7H918 Plastic
49-666	SP-1	4" P.M. Speaker
		208-666 Cone & Voice Coil
		206-666 Output Transformer.
54-139		#3/8-32x9/16" Palnut Steel Cad. (Used to Mt. 63-2035).
54-267		#6-32x5/16" Palnut Steel Cad. (Used to Mt. I.F. Trans)
58-128		Two Prong Plug.
78-788		Noval Miniature Tube Socket
78-806		Miniature Tube Socket
78-807		Miniature Tube Socket (4 used)
78-850		Noval Miniature Tube Socket
83-1635		Insulating Strip (used behind 63-2035).
93-35		.032x.144x3/8 Steel Washer (4 used on Mtg. Back)
93-125		#6 Internal Shakeproof Lockwasher #1206 (used on 212-7)
93-993		Volume Control Insulating Washer.
93-994		Insulating Shoulder Washer.
112-131		#8-32x1/4" B.H.M.S. Steel (2 used on Back Terminals).
112-697		#6x7/16" Straight Side B.H.S.T. (4 used to mt. Back) (2 used to Mt. chassis)
114-253		#6x3/8 Hex. Hd. Sl. S.T.Screw (2 used to Mt. Sprk to cabinet).
114-308		#6-32x1-1/8" Hex. Hd. Sl. M.S.Steel (used on 212-7).
125-73		Rubber Grommet (Coil Mtg.).
149-87		Iron Core & Spring (2 used)
202-697		F.M. Instruction Book
202-720		Instruction Book.
212-7	SE-1	Selenium Rectifier.
S-15682		Cabinet Back, Line Cord and Plug Assembly

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1 (a)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L9 coil slug Primary discr.	Align primary of discriminator for maximum reading.
2 (b)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
3 (a)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L8 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
4 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 2nd IF trans.	Align 2nd IF transformer for maximum reading.
5 (c)	Pin 7 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L4 and L5 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
6 (c) (d)	Antenna Post FM (Remove line ant)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Osc. Coil Slug	Set Oscillator to dial scale
7 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L2 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

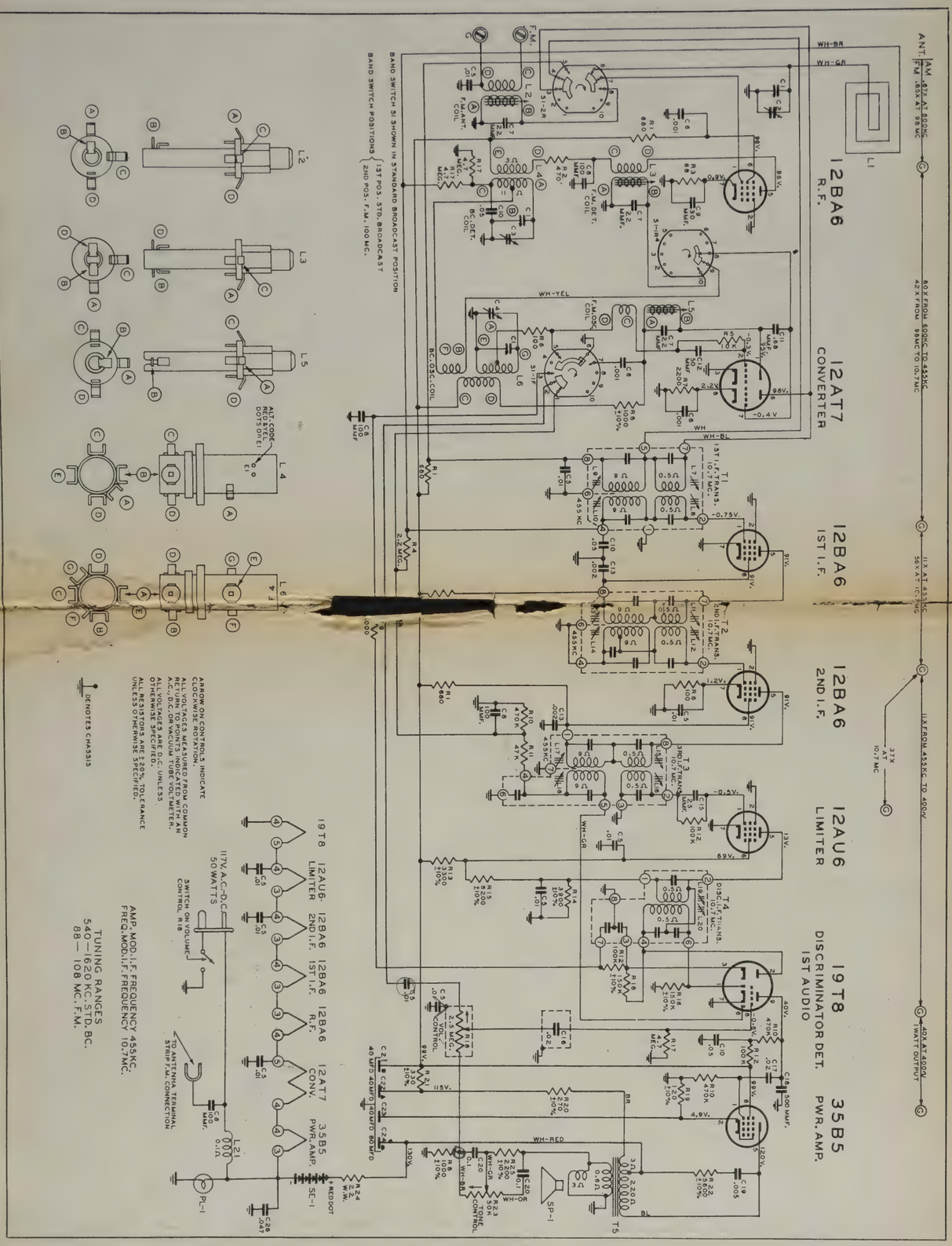
Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

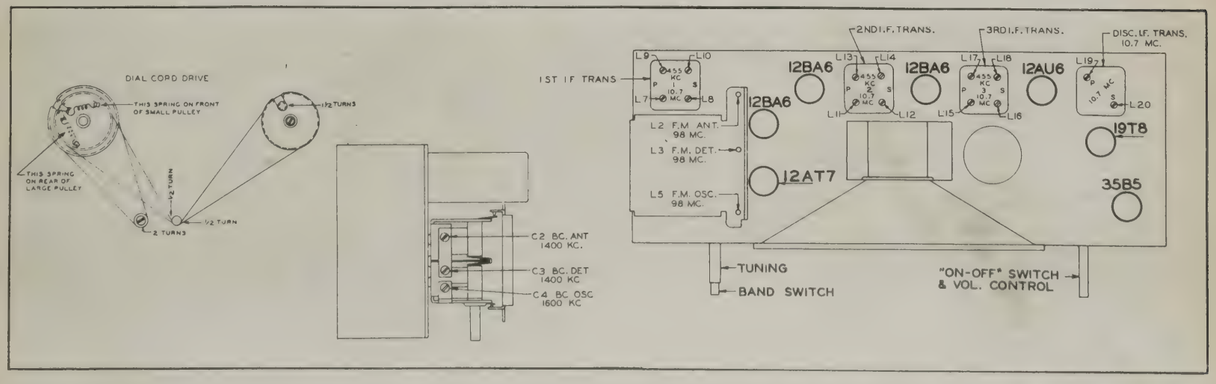
Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.


12BA6 R.F.
12AT7 CONVERTER
12BA6 1ST I.F.
12BA6 2ND I.F.
12AU6 LIMITER
19T8 DISCRIMINATOR DET. 1ST AUDIO
35B5 PWR. AMP.
ANT. AM .82X AT 600KC FM .185X AT 98 MC
80X FROM 600KC TO 4455KC 42X FROM 98MC TO 10.7MC
11X AT 455KC 56X AT 10.7MC
11X FROM 455KC TO 400KV
37X 10.7 MC
40X AT 400KV 1WATT OUTPUT
BAND SWITCH SHOWN IN STANDARD BROADCAST POSITION
BAND SWITCH POSITIONS (1ST POS. STD. BROADCAST 2ND POS. F.M. 100 MC.)
ALT. CODE RED SPOT-E1 DOT-E1
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C.-D.C. ON MODEL TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
117V. A.C.-D.C. 50 WATTS
SWITCH ON VOLUME CONTROL R18
TO ANTENNA TERMINAL STRIP F.M. CONNECTION
AMP. MOD. I.F. FREQUENCY 455KC. FREQ. MOD. I.F. FREQUENCY 10.7MC.
TUNING RANGES 540—1620 KC. STD. BC. 88—108 MC. F.M.
T1 1ST I.F. TRANS. 10.7 MC.
T2 2ND I.F. TRANS. 10.7 MC.
T3 3RD I.F. TRANS. 10.7 MC.
T4 DISC. I.F. TRANS. 10.7 MC.
T5 OUTPUT TRANS.
SP-1 SPEAKER
SE-1 SELENIUM RECTIFIER
PL-1 PILOT LAMP
R20 TONE CONTROL
R21 VOL. CONTROL
R22 BASS CONTROL



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7F01 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

When adjustments are made on the 7F01 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12AT7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L-9, 10, 13, 14, 17 and 18	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2 and C3	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L19 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L20 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 and L16 Prim. and Sec. of 3rd. IF transformer	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer	Align 2nd. IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer	Align 1st. IF Transformer for maximum reading.
9 (c) (d)	Antenna Post F (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 and L2 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

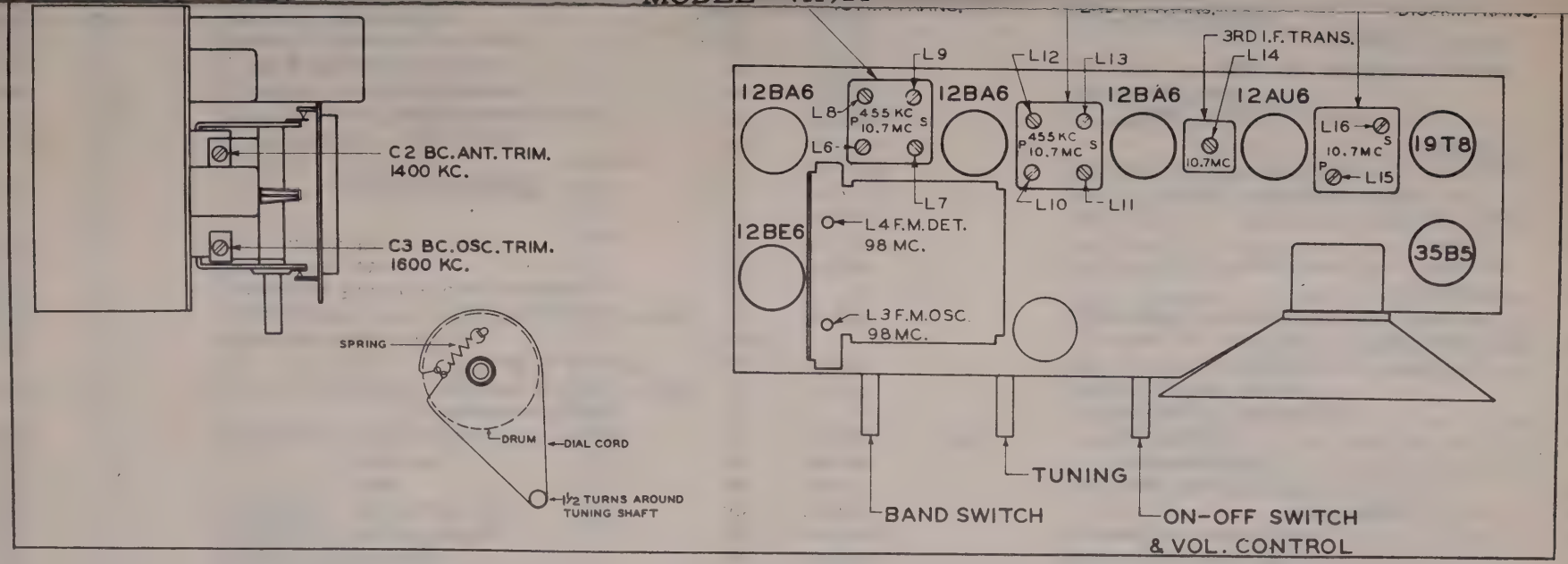
The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7F04 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7F04 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

PARTS LIST

PART NO.	REF.NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
12-1407		Dial Light Socket Mounting Bracket	.03
26-389		Louvre Dial	1.75
46-538		Tuning Control Knob	.10
46-688		Tone Control Knob	.12
46-718		Band Switch Knob	.15
54-211		Speed Nut (4 used on Dial Scale Mtg.)	.007
57-1335		Tone Knob Esc.	1.00
76-493		Tuning Shaft	.25
78-786		Dial Light Socket	.60
80-69		Dial Cord Spring	.05
80-209		Dial Cord Spring	.024
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-581		Tuner Arm Pressure Spring	.10
83-1504		Dial Light Shield	.03
93-475		Felt Washer (S-14129)	1.81C
93-690		Felt Washer (Used on S-13944)	.60C
94-371		Pointer Pulley Bushing	.048
100-97		Dial Light Bulb	.50
114-26		#8 x 1/4" Hex. Hd. S.T. Screw Type Z Cad. (Used on 12-1407)	.55C
188-30		Retaining Ring	1.20C
188-102		Clamping Ring	.02
S-13944		Pointer, Pulley & Bushing Assembly (59-205)	.30
S-13945		Cam, Pulley and Bushing	.55
S-13981		Tone Control Bracket & Lug Assembly	.25
S-13982		Dial Cord & Eyelet Assembly	.05
S-13983		Dial Cord & Eyelet Assembly	.06
S-14129		Volume Control Knob Assembly	.30
S-14429		Tuner Arm Assembly	.80
		COILS & CHOKES	
S-12256	L21	A.C. Line Choke Coil Assembly	.35
S-13971	T2	2nd. I.F. Transformer Assembly	2.75
S-13972	T3	3rd. I.F. Transformer Assembly	3.00
S-13973	T4	Discriminator Transformer Assembly	2.00
S-13974	L4	Broadcast Detector Coil Assembly	1.00
S-14192	L2	F.M. Antenna Coil Assembly	.70
S-15733	L5	F.M. Oscillator Coil Assembly	.55
S-15743	L3	F.M. Detector Coil Assembly	
S-15888	L6	Broadcast Osc. Coil Assembly	
S-15981	T1	1st. I.F. Transformer Assembly	
		CONDENSERS	
22-3	C5	.01 Mfd. Ceramic (Disc.) 500 V.	.26
22-829	C10	.05 Mfd. 200 V.	.20
22-854	C18	.0005 Mfd. 600 V.	.20
22-1220	C13	.002 Mfd. 600 V.	.20
22-1367	C12	50 Mmfd. Ceramic 500 V.	.33
22-1506	C7	22 Mmfd. Ceramic 500 V.	.33
22-1507	C15	25 Mmfd. Ceramic 500 V.	.33
22-1661	C21,22 23, & 24	Elect. 8-4-40 Mfd. 150V-40 Mfd. 25 V.	3.00
22-1669	C8	100 Mmfd. Ceramic 500 V.	.20
22-1676	C6	.001 Mfd. Ceramic 500 V.	.40
22-1677	C1	Three Gang Variable	4.35
22-1683	C16	.02 Mfd. (Shielded) 400 V.	.40
22-1702	C19	.005 Mfd. 400 V.	.20
22-1705	C9	30 Mmfd. Ceramic 500 V.	.20
22-1766	C11	.68 Mmfd. (Molded) 500 V.	
22-1775	C26	.047 Mfd. 400 V.	.26
22-2084	C20	.1 Mfd. 200 V.	
		RESISTORS	
63-1202	R21	330 Ohm W.W. 2 W 10% Ins. Res.	.36
63-1450	R24	22 Ohm W.W. 1 W 20% Ins. Res.	.24
63-1452	R20	270 Ohm W.W. 2 W 10% Ins. Res.	.33
63-1582	R23	Tone Control	1.20
63-1584	R18	Volume Control & Switch	1.81
63-1737	R3	68 Ohm 1/2 W. 20% Ins. Res.	.21
63-1744	R6	100 Ohm 1/2 W. 20% Ins. Res.	.21
63-1747	R19	120 Ohm 1/2 W. 10% Ins. Res.	.21

PART NO.	REF.NO.	DESCRIPTION	PRICE
		RESISTORS	
63-1772	R2	470 Ohm 1/2 W. 20% Ins. Res.	.21
63-1779	R1	680 Ohm 1/2 W. 20% Ins. Res.	.21
63-1785	R8	1000 Ohm 1/2 W. 10% Ins. Res.	.21
63-1786	R9	1000 Ohm 1/2 W. 20% Ins. Res.	.21
63-1799	R25	2200 Ohm 1/2 W. 10% Ins. Res.	.21
63-1800	R7	2200 Ohm 1/2 W. 20% Ins. Res.	.21
63-1806	R13	3300 Ohm 1/2 W. 10% Ins. Res.	.21
63-1810	R14	3900 Ohm 1/2 W. 10% Ins. Res.	.21
63-1817	R22	5600 Ohm 1/2 W. 10% Ins. Res.	.21
63-1824	R15	8200 Ohm 1/2 W. 10% Ins. Res.	.21
63-1828	R5	10K Ohm 1/2 W. 20% Ins. Res.	.21
63-1856	R11	47K Ohm 1/2 W. 20% Ins. Res.	.21
63-1870	R12	100K Ohm 1/2 W. 20% Ins. Res.	.21
63-1876	R16	150K Ohm 1/2 W. 10% Ins. Res.	.21
63-1898	R10	470K Ohm 1/2 W. 20% Ins. Res.	.21
63-1926	R4	2.2 Megohm 1/2 W. 20% Ins. Res.	.21
63-1940	R17	4.7 Megohm 1/2 W. 20% Ins. Res.	.21
		MISCELLANEOUS	
12-1070		Wavemagnet Mounting Bracket (2 used)	.25
14-851		Cabinet for 7H920W (or 14-848)	11.00
14-1020		Cabinet for 7H920 (or 14-850)	10.00
19-139		Cabinet Back Retaining Clip (4 used)	.03
49-608	SP-1	7 1/2" P. M. Speaker	8.75
		208-608 Cone & Voice Coil Assembly	2.63
54-139		#3/8-32 x 9/16" Palnut Type 9N Steel Cad. (Used to mount Volume Control)	.008
54-140		#3/8-32 x 9/16" Hex. Nut Steel (Used to mount Tone Control)	.03
54-226		Speed Nut Tinnerman (3 used to mount Tuning Cores)	.01
57-1269		I.F. Transformer Terminal Plate	.06
58-128		Two Prong Plug	.15
74-52		Plastic Speaker Screen	.85
78-782		Minature Tube Socket (7 contact)	.25
78-788		Minature Tube Socket (9 contact)	.35
78-794		Minature Tube Socket (3 used)	.20
78-795		Minature Tube Socket (7 contact)	.20
78-854		Minature Tube Socket (9 contact)	.35
85-464		Band Switch	3.00
93-665		Fibre Washer (2 used on S-14385)	.009
93-719		.031 x 5/16 x 7/16 Steel Washer Cad. Pl. (4 used on 74-52)	.35C
94-334		Speaker Mounting Bushing	.67C
94-485		Fibre Bushing (1 ea. used on 63-1584 and 63-1582)	.027
94-598		R.F. Plate Mounting Bushing (4 used)	.01
95-1035		Output	2.65
97-284		Dial Cord Guide Stud	.17
97-293		Insulating Stud (4 used on Chassis Mtg.)	.18
110-130		Grill Cloth	.30
112-281		#10 x 3/4" Oval B.H.S.T. Stat. Bronze (4 used on chassis mounting)	1.20C
112-697		#6 x 7/16" Straight Side B.H.S.T. Steel Cad. Pl. (4 used on back)	.013
114-26		#8 x 1/4" Hex. Hd. S.T. Screw Steel Cad. Pl. (2 used on S-13977)	.55C
114-78		#6 x 32 x 5/16" Hex. Hd. Slotted S. T. (Wavemagnet Mtg.)	1.40C
114-160		#6 x 7/8" Hex. Hd. S. T. Screw (1 used to Mt. 212-3)	1.20C
114-292		#6 x 5/8" Hex. Hd. Sl. S. T. Screw (8 used)	.01
114-319		#8-32 x 11/16" Hex. Hd. Slotted M.S. Steel (4 used)	.015
125-17		Rubber Grommet (4 used on 49-608)	.03
125-62		Rubber Grommet (4 used on R.F. Plate)	.02
139-69		Speaker Baffle	.45
149-64		Tuning Core (3 used)	.40
188-34		Ring (Used on 63-1582)	1.20C
202-697		F.M. Instruction Book	.10
202-741		Instruction Book	.15
212-3	SE-1	Selenium Rectifier	2.00
S-13977	L1	Wavemagnet Assembly	1.25
S-14128		Cabinet Back, A.C. Plug & Cord Assembly (Complete)	1.75
S-14358		Wavemagnet Cable Assembly	.20
S-14562		Cabinet Back, A.C. Plug & Cord Assembly (W Model Only) (Complete)	2.00

All prices shown are suggested list prices and subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12AT7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L-9, 10, 13, 14, 17 and 18	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2 and C3	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L19 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L20 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 and L16 Prim. and Sec. of 3rd. IF transformer	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer	Align 2nd. IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer	Align 1st. IF Transformer for maximum reading.
9 (c) (d)	Antenna Post F (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 and L2 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

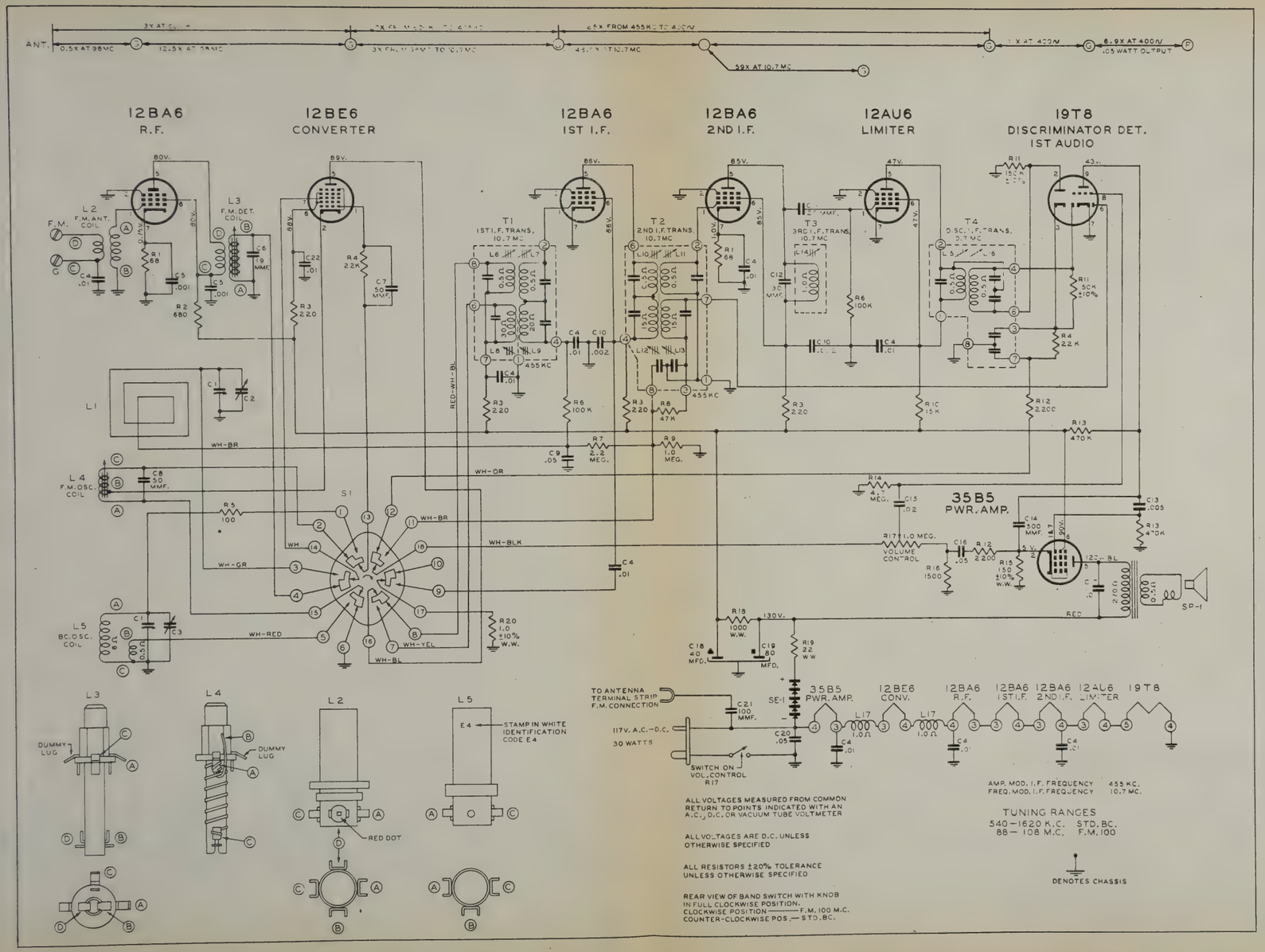
The signal generator output should be kept just high enough to get an indication on the meter.

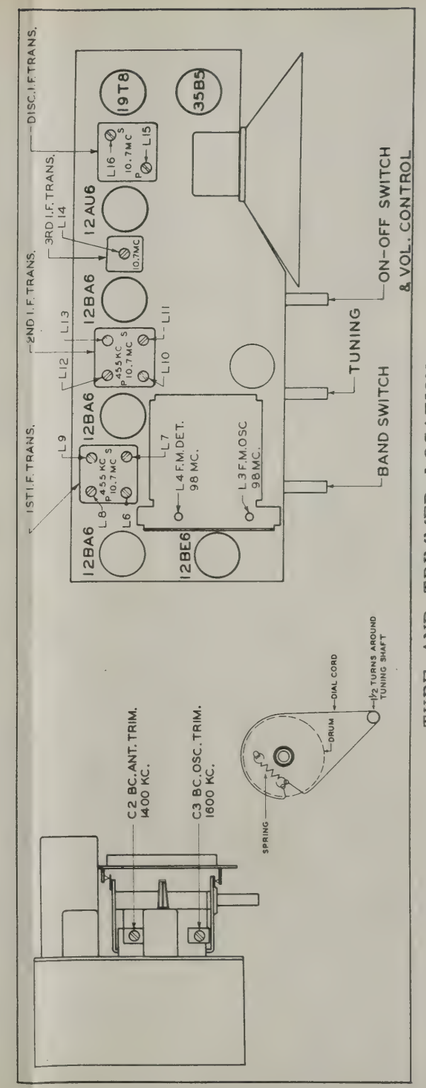
(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.





TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7F04 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7F04 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

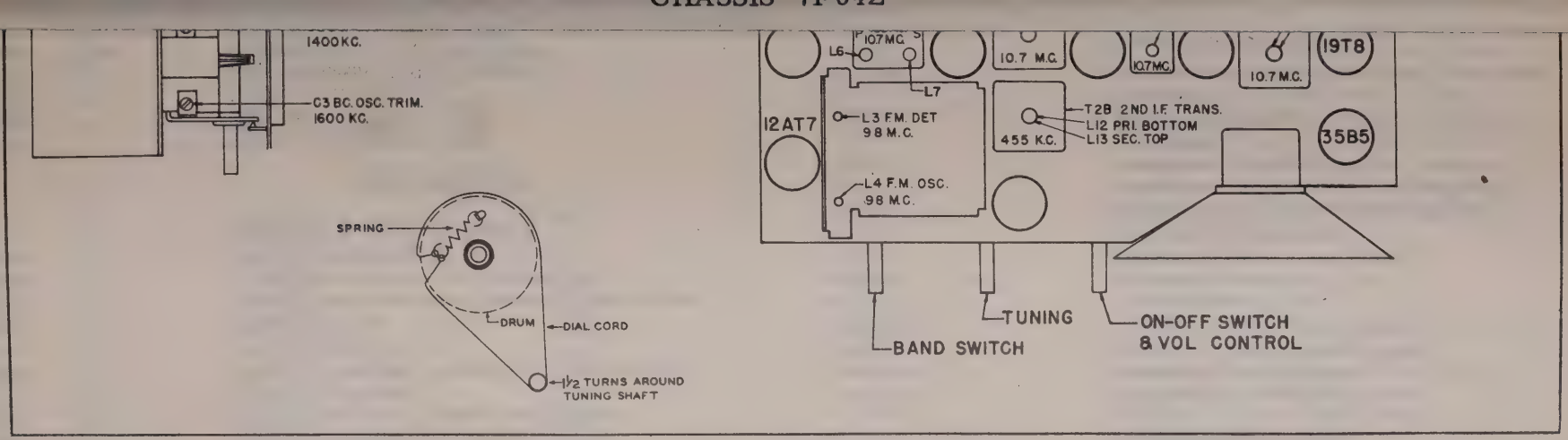
An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7F04Z chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7F04Z or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the 1st. IF transformer are threaded and screw into the coil form. The slug is slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible. The remaining IF transformers are of a different design in which the primary and secondary are stacked. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

PARTS LIST

PART NO.	REF.NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-403		Dial Scale	.85
46-734		Tuning & Vol. Control Knob (2 Used)	.10
46-735		Band Switch Knob	.20
46-769		Tuning & Vol. Control Knob (2 Used on W Model only)	.15
46-770		Band Switch Knob (W Model only)	.20
57-1486		Cabinet Emblem Plate	.05
59-146		Dial Pointer	.24
76-506		Tuning Control Shaft	.15
80-402		Dial Cord Tension Spring	.03
80-444		Tuner Arm Tension Spring	.05
80-580		" " Stop "	.06
80-581		" " Pressure "	.10
93-956		1/16 X 9/32 X 3/4" Black Felt Washer (Used on 59-146)	.01
114-271		#6 X 1/2" Hex Hd. Slotted S.T. Type Z N.P. (1 Used on 26-403)	.01
188-32		Retaining Ring (76-506)	1.03C
S-14523		Tuning Shaft Brkt. & Insulating Strip Assem.	.20
S-14524		Condenser Pulley & Cam Assem.	.55
S-14525		Tuner Arm Assem.	.75
S-14526		Dial Cord & Eyelet Assem.	.05
		COILS & CHOKES	
S-13871	L3	F. M. Detector Coil Assem.	.75
S-13973	T4	Discriminator Transformer Assem.	2.00
S-13997	L17	Filament Choke Coil Assem.	.40
S-14480	L2	F. M. Antenna Coil Assem.	.50
S-14481	L5	Broadcast Osc. Coil Assem.	.75
S-14509	T3	3rd. I. F. Coil Assem.	2.50
S-14521	T1	1st. I. F. Trans. "	2.50
S-14522	T2	2nd. I. F. Trans. "	2.75
S-14695	L4	F. M. Osc. Coil Assem.	.60
		CONDENSERS	
22-3	C22	.01 Mfd. (Ceramic) 500V	.26
22-162	C21	100 " (Mica) (or 22-1669) 500V	.20
22-229	C13	.005 " 600V	.20
22-829	C9	.05 " 200V	.20
22-830	C15	.02 " 600V	.20
22-854	C14	500 Mmfd. 600V	.20
22-1017	C20	.05 Mfd. 400V	.20
22-1126	C17	.01 " 400V	.20
22-1158	C16	.05 " 200V	.20
22-1220	C10	.002 " (2 Used) 600V	.20
22-1385	C4	.01 Mfd. (9 Used) 200V	.20
22-1492	C8	50 Mmfd. (Ceramic) 500V	.27
22-1507	C11	25 " (") 500V	.33
22-1511	C7	50 " (") 500V	.33
22-1676	C5	.001 Mfd. (") 500V	.40
22-1688	C6	19 Mmfd. (") 500V	.30
22-1742	C1	Two Section Variable	3.00
22-1757	C18,19	Electrolytic Cond. 80-40 Mfd. 150V	2.50
22-1768	C12	30 Mmfd. (Ceramic) 500V	.20
		RESISTORS	
63-686	R15	150 Ohm W.W. 1/2W 10% Ins.	.21
63-1223	R20	1 Ohm " " " "	.21
63-1450	R19	22 Ohm " 1W 20% "	.24
63-1527	R18	1000 Ohm " 3W " "	.39
63-1646	R17	Volume Control & Switch	1.81
63-1737	R1	68 Ohm 1/2W 20% Ins.	.21
63-1744	R5	100 " " " "	.21
63-1758	R3	220 " " " " (4 Used)	.21
63-1779	R2	680 " " " "	.21
63-1793	R16	1500 Ohm " " "	.21
63-1800	R12	2200 " " " " (2 Used)	.21
63-1835	R10	15K " " " "	.21
63-1842	R4	22K " " " " (2 Used)	.21
63-1856	R8	47K " " " "	.21
63-1870	R6	100K " " " " (2 Used)	.21
63-1876	R11	150K " " " " (2 Used)	.21
63-1898	R13	470K " " " "	.21
63-1912	R9	1 Meg." " " "	.21
63-1926	R7	2.2 Meg. Ohm " " "	.21
63-1940	R14	4 7 " " " " "	.21
		RESISTORS	
63-1876	R11	150K " " " " (2 Used)	.21
63-1898	R13	470K " " " "	.21
63-1912	R9	1 Meg." " " "	.21
63-1926	R7	2.2 Meg. Ohm " " "	.21
63-1940	R14	4 7 " " " " "	.21
		MISCELLANEOUS	
12-1070		Wavemagnet Mtg. Brkt.	.25
14-1022		Cabinet For Model 7H921	5.00
		" " " 7H921 White	6.50
14-855		Coil Mtg. Clip (S-14509)	.06
19-179		" Retaining Clip	
19-189			
49-667	SP-1	4" P.M. Speaker	6.00
		208-667 Cone & Voice Coil	1.73
		206-667 Output Trans.	1.67
54-139		3/8-32 X 9/16" Palnut-Type 9 N Cad. (1 Used on Vol. Cont. - 1 Used on 85-430)	.01
54-266		Speed Nut (1 Used S-13871 & 1 Used on S-14695)	.04
54-267		#6-32 X 5/16 Palnut Steel Cad. (Used on 26-403)	.45C
54-269		#8-32 X 5/16 " " " (1 Ea. Used on I. F.'s & Disc. Trans.)	.01
54-271		#6-32 X 1/4" Palnut Steel Cad. (2 Used on S-14509)	.01
57-1269		I.F. Trans. Terminal Plate (6 Used)	.06
58-128		Two Prong Plug	.15
73-30		#6-32 X 1/4" Hex. Hd. Slotted Set Screw Cuppoint (2 Used)	.02
78-787		Two Contact Socket	.10
78-788		Miniature Tube Socket (9 Contact)	.35
78-806		" " "	.15
78-807		" " " (5 Used)	.15
83-1056		Wavemagnet Mtg. Strip	.03
83-1090		Insulating Strip	.02
83-1498		" " (3 hole strip over controls)	.04
83-1520		Rectifier Insulating Strip	.03
83-1545		Insulating Strip (1 Ea. Used on S-13973 - S-14521 & S-14522)	.02
83-1593		Felt Strip (2 Used on Dial Glass)	.01
85-430	S1	Band Switch	1.50
93-125		#6 Int. Shakeprf. Lockwasher #1206 (6 Used)	.31C
93-855		1/8" thick X 3/4" diameter Rubber Washer (mtg. on Speaker Flange)	.03
93-910		Felt Washer - Brown (3 Used behind Knobs)	.01
97-293		Chassis Mtg. Stud (2 Used)	.18
112-281		#10 X 3/4" Oval Bind. Hd. S.T. Type Z Stat. Bronze (2 Used to mount chassis)	1.20C
112-697		#6 X 7/16" Straight Side B.H.S.T. Steel Cad. Pl. (4 Used on S-14549)	.02
113-26		#6-32 X 1/4" Hex. Hd. Slotted M.S. Steel Shakeprf. Lock (2 Used)	.02
114-92		#6 X 1-1/8" Hex. Hd. S.T. Type Z Cad. Pl. (1 Used on 212-3)	1.50C
114-293		#6 X 32 X 3/8" Hex Hd. Slotted M.S. Steel (1 Ea. Used on 26-403 & 139-79)	.02
139-79		Speaker Baffle	.05
149-64		Iron Core & Spring (2 Used)	.40
149-65		" " " (1 Used on S-14509)	.10
159-50		Cinch Plug Button-Black (4 Used to Mt. dial glass)	.01
192-117		Dial Glass	.75
196-111		Speaker Gasket	.55
199-35		Dial Scale Spacer Sleeve	.05
202-697		F.M. Instruction Book	.10
202-721		Instruction Book	.06
212-3	SE-1	Selenium Rectifier	2.00
S-14527		Wavemagnet Lead & Stop Assem.	.20
S-14549		Cabinet Back, Socket & A.C. Cord Assem.	1.75
S-14957		Wavemagnet Assem.	1.25
S-15325		Cabinet Back, Socket & A.C. Cord Assem.	2.00
S-15739		Speaker Support Brkt. & Plate Assem.	.20

Prices Subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

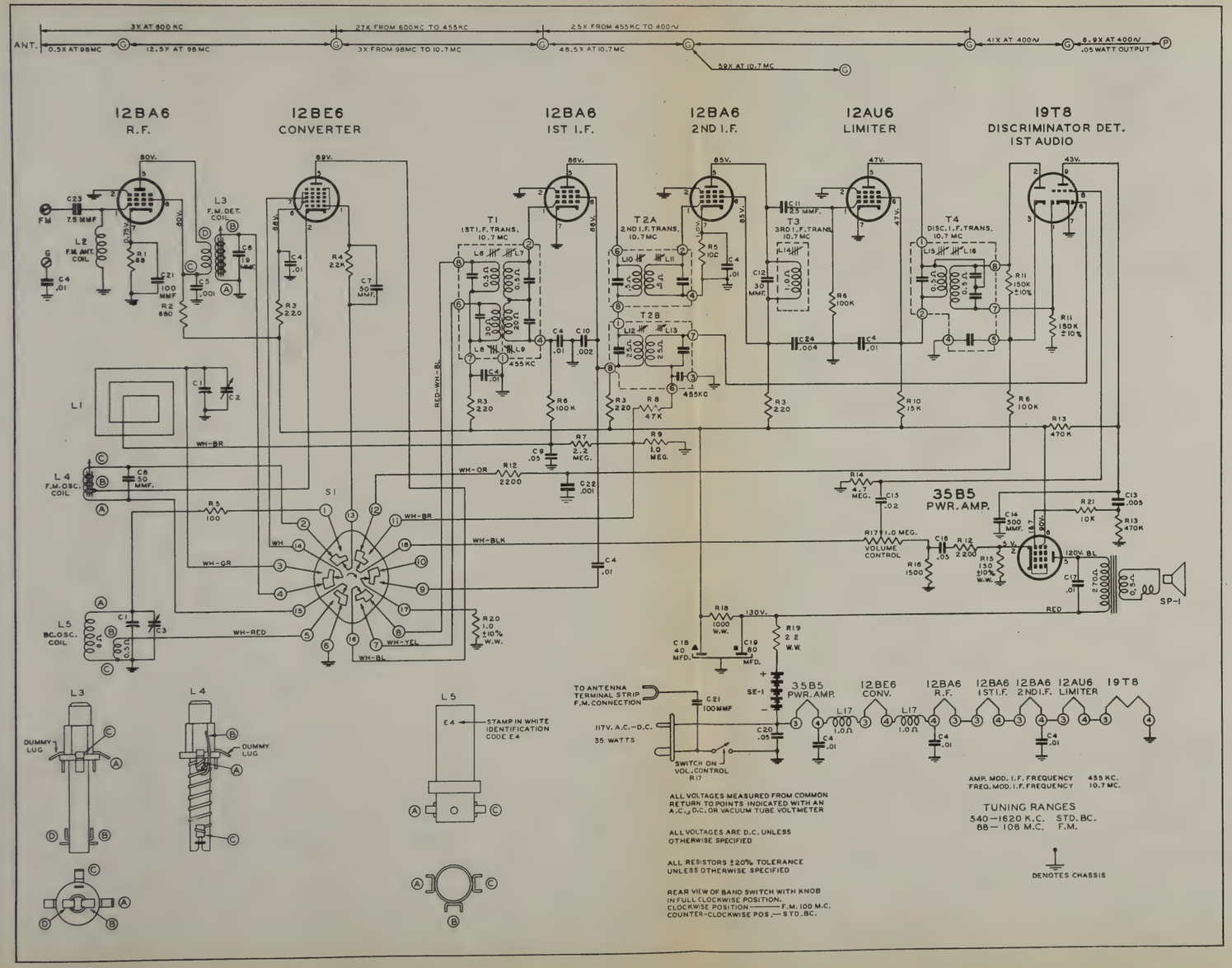
(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

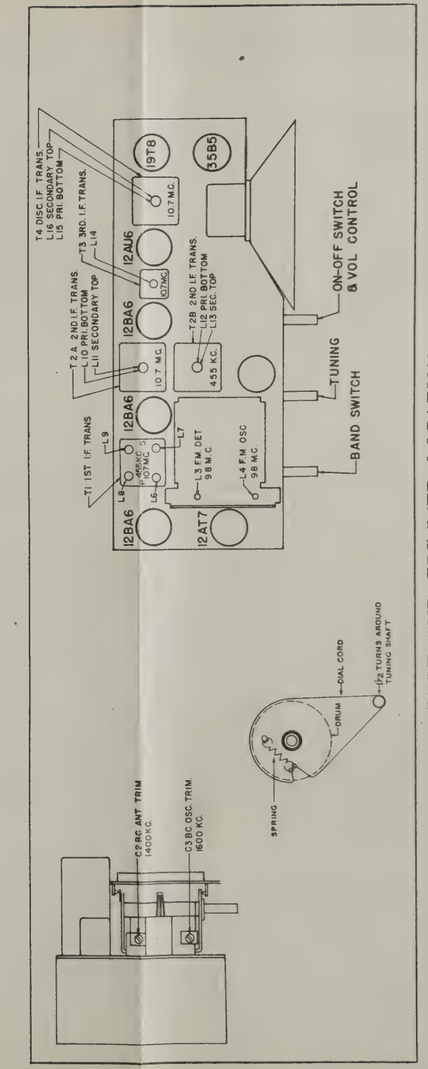
(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

MODEL 7H921Z
CHASSIS 7F04Z





TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7F04Z chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7F04Z or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the 1st, IF transformer are threaded and screw into the coil form. The slug is slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible. The remaining IF transformers are of a different design in which the primary and secondary are stacked. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjust-

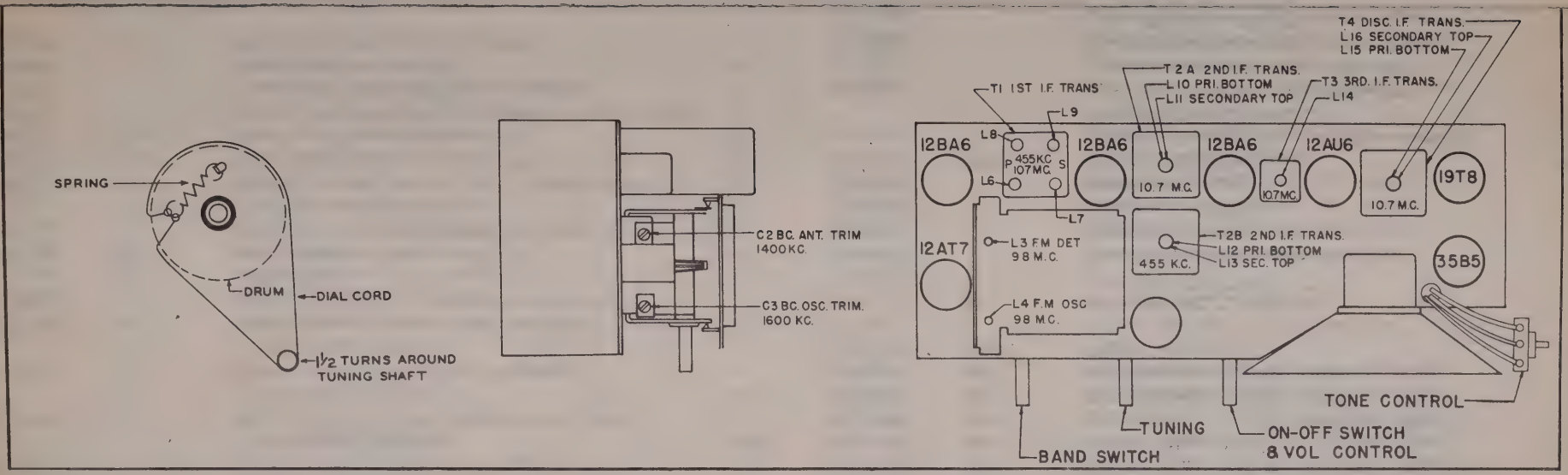
The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7F02 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7F02 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

PART NO.	REF.NO.	DESCRIPTION
		DIAL ASSEMBLY
26-403		Dial Scale
46-734		Tuning & Volume Control Knob (2 Used)
46-735		Band Switch Knob
46-769		Tuning & Volume Control Knob (2 Used on W. Model only)
46-770		Band Switch Knob (W Model only)
57-1486		Cabinet Emblem Plate
59-146		Dial Pointer
76-568		Tuning Control Shaft
80-402		Dial Cord Tension Spring
80-444		Tuner Arm Tension Spring
80-580		Tuner Arm Stop Spring
80-581		Tuner Arm Pressure Spring
93-956		1/16 x 9/32 x 3/4", Black Felt Washer (Used on 59-146)
114-271		#6 x 1/2" Hex Hd. Slotted S.T. Type Z N.P. (1 Used on 26-403)
188-32		Retaining Ring
S-14523		Tuning Shaft Bracket & Insulating Strip Assem.
S-14524		Condenser Pulley & Cam Assembly
S-14525		Tuner Arm Assembly
S-16153		Dial Cord & Eyelet Assembly
		COILS & CHOKES
95-1150		T2A 2nd. I.F. Trans. FM
95-1102		T2B 2nd. I.F. Trans. AM
95-1153		T4 Disc. I.F. Trans.
S-13871	L3	F.M. Detector Coil Assembly
S-13997	L17	Filament Choke Coil Assembly
S-15690	L2	F.M. Antenna Coil Assembly
S-14481	L5	Broadcast Osc. Coil Assembly
S-14509	T3	3rd. I.F. Coil Assembly
S-14521	T1	1st I.F. Trans. Assembly
S-14695	L4	F.M. Osc. Coil Assembly
		CONDENSERS
22-3	C4	.01 Mfd. (Ceramic) 500V
22-229	C13	.005 Mfd. 600V
22-448	C24	.004 Mfd. 600V
22-829	C9	.05 Mfd. 200V
22-830	C15	.02 Mfd. 600V
22-854	C14	500 Mmfd. 600V
22-887	C22	.001 Mfd. 600V
22-1017	C20	.05 Mfd. 400V
22-1126	C17	.01 Mfd. 400V
22-1158	C16	.05 Mfd. 200V
22-1220	C10	.002 Mfd. (2 Used) 600V
22-1492	C8	50 Mmfd. (Ceramic) 500V
22-1507	C11	25 Mmfd. (Ceramic) 500V
22-1511	C7	50 Mmfd. (Ceramic) 500V
22-1669	C21	100 Mfd. (Ceramic) 500V
22-1676	C5	.001 Mfd. (Ceramic) 500V
22-1688	C6	19 Mmfd. (Ceramic) 500V
22-1742	C1	Two Section Variable
22-1757	C18,19	Electrolytic Cond. 80-40 Mfd. 150V
22-1768	C12	30 Mmfd. (Ceramic) 500V
22-1852	C23	7.5 Mmfd. 500V
		RESISTORS
63-686	R15	150 Ohm W.W. 1/2W 10% Ins.
63-1223	R20	1 Ohm W.W. 1/2W 10% Ins.
63-1450	R19	22 Ohm W.W. 1W 20% Ins.
63-1527	R18	1000 Ohm W.W. 3W 20% Ins.
63-1646	R17	Volume Control and Switch
63-1737	R1	68 Ohm 1/2W 20% Ins.
63-1744	R5	100 Ohm " " "
63-1758	R3	220 " " " "
63-1779	R2	680 " " " "
63-1793	R16	1500 " " " "
63-1800	R12	2200 " " " "

PART NO.	REF.NO.	DESCRIPTION
		RESISTORS
63-1828	R21	10M Ohm 1/2W 20% Ins.
63-1835	R10	15K " " " "
63-1842	R4	22K " " " "
63-1856	R8	47K " " " "
63-1870	R6	100K " " " "
63-1876	R11	150K " " " "
63-1898	R13	470K " " " "
63-1912	R9	1 Megohm " " "
63-1926	R7	2.2 " " " "
63-1940	R14	4.7 " " " "
		MISCELLANEOUS
12-1070		Wavemagnet Mounting Bracket
14-1022		Cabinet for Model 7H921
14-855		Cabinet for Model 7H921 White
19-179		Coil Mounting Clip (S-14509)
19-189		Coil Retaining Clip
49-667	SP-1	4" P.M. Speaker 208-667 Cone & Voice Coil 206-667 Output Trans.
54-139		3/8-32 x 9/16" Palnut-Type 9 N. Cad. (1 used on Vol. Cont. - 1 used on 85-430)
54-266		Speed Nut (1 used S-13871 & 1 used on S-14695)
54-267		#6-32 x 5/16 Palnut Steel Cad. (Used on 26-403)
54-269		#8-32 x 5/16 Palnut Steel Cad. (1 ea. used on I.F.'s & Disc. Trans.)
54-271		#6-32 x 1/4" Palnut Steel Cad. (2 used on S-14509)
57-1269		I.F. Trans. Terminal Plate (6 used)
58-128		Two Prong Plug
73-30		#6-32 x 1/4" Hex. Hd. Slotted Set Screw Cuppoint (2 used)
78-787		Two Contact Socket
78-788		Miniature Tube Socket (9 Contact)
78-806		Miniature Tube Socket
78-807		Miniature Tube Socket (5 used)
83-1056		Wavemagnet Mounting Strip
83-1090		Insulating Strip
83-1498		Insulating Strip (3 hole strip over controls)
83-1520		Rectifier Insulating Strip
83-1545		Insulating Strip (1 ea. used on S-13973 - S-14521 & S-14522)
83-1593		Felt Strip (2 used on Dial Glass)
85-430	S1	Band Switch
93-125		#6 Int. Shakeproof Lockwasher #1206 (6 used)
93-910		Felt Washer - Brown (3 used behind knobs).
112-281		#10 x 3/4" Oval Bind. Hd. S. T. Type Z Stat. Bronze (2 used to mount chassis.)
114-92		#6 x 1-1/8" Hex. Hd. S. T. Type Z Cad. Pl. (1 used on 212-3)
114-293		#6 x 32 x 3/8" Hex. Hd. Slotted M.S. Steel (1 ea. used on 26-403 & 139-79)
139-79		Speaker Baffle
149-64		Iron Core & Spring (2 used)
149-65		Iron Core & Spring (1 used on S-14509)
159-50		Cinch Plug Button-Black (4 used to Mount dial glass)
192-117		Dial Glass
196-111		Speaker Gasket
199-35		Dial Scale Spacer Sleeve
202-697		F.M. Instruction Book
202-721		Instruction Book
212-3	SE-1	Selenium Rectifier
S-14527		Wavemagnet Lead & Stop Assembly
S-14549		Cabinet Back, Socket & A.C. Cord Assembly
S-14957	L1	Wavemagnet Assembly
S-14548		Cabinet Back, Socket & A.C. Cord Assembly
S-15739		Speaker Support Bracket & Plate Assembly

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line cnt.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

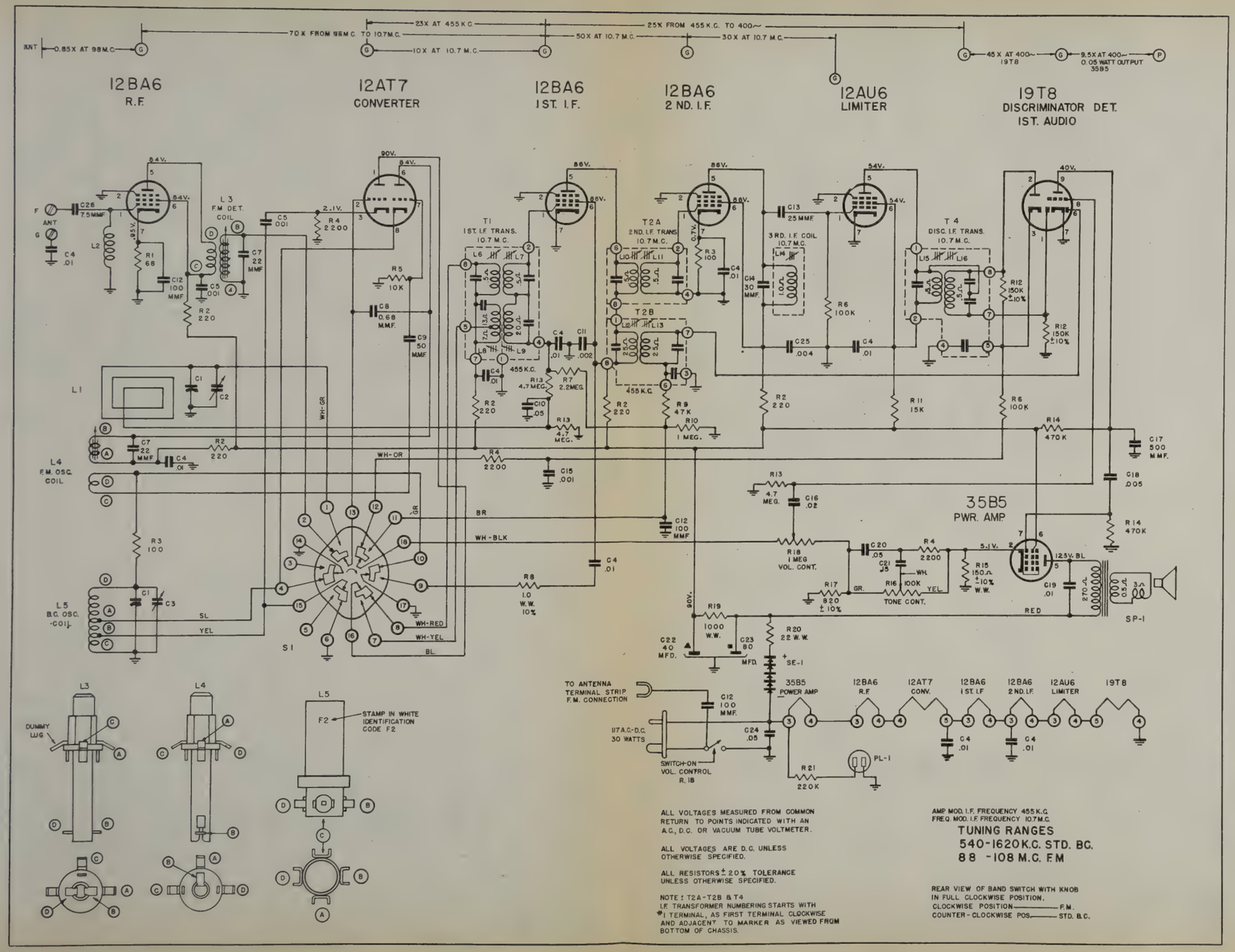
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

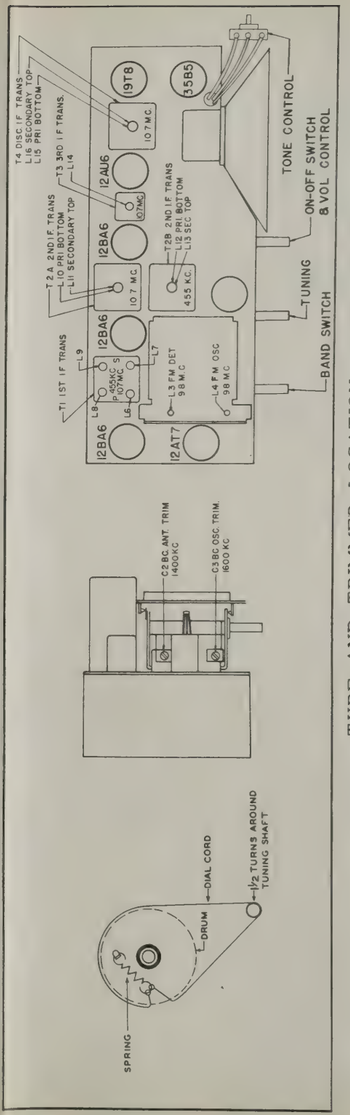
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

MODEL 7H922
CHASSIS 7F02





TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7F02 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7F02 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z800j) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leeds of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd. IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-396		Dial Scale	$0.95
59-209		Dial Pointer	.30
76-498		Pointer Shaft	.08
76-499		Tuning Control Shaft	.25
78-797		Dial Light Socket	.30
80-69		Dial Cord Tension Spring	.02
80-209		Dial Cord Tension Spring	.03
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-581		Tuner Arm Pressure Spring	.10
93-721		Black Felt Dial Washer	.01
100-36	PL-1	Dial Light Bulb Mazda #44	.09
149-64		Tuning Core & Spring	.40
188-32		Retaining Ring (76-499)	1.03C
S-14254		Pointer Pulley Assembly	.25
S-14256		Pulley & Bushing Assembly	.50
S-14268		Dial Cord & Eyelet Assembly (Short)	.05
S-14269		Dial Cord & Eyelet Assembly (Long)	.06
S-14270		Dial Scale & Strip Assembly (26-396)	1.15
S-14429		Tuner Arm Assembly	.80
		COILS AND CHOKES	
S-11157	L8	Broadcast Oscillator Coil Assembly	.53
S-12256	L24	A. C. Line Choke Coil Assembly	.35
S-12259	L7	F. M. Oscillator Coil Assembly	.33
S-13800	L23	Tone Choke Assembly	.60
S-13871	L4	F. M. Detector Coil Assembly	.75
S-13970	T1	1st. I. F. Transformer Assembly	2.50
S-13971	T2	2nd. I. F. Transformer Assembly	2.75
S-13972	T3	3rd. I. F. Transformer Assembly	3.00
S-13973	T4	Discriminator Transformer Assembly	2.00
S-13974	L6	Broadcast Detector Coil Assembly	1.00
S-14126	L5	R. F. Choke Coil Assembly	.35
S-14192	L3	F. M. Antenna Coil Assembly	.70
		CONDENSERS	
22-171	C26	.05 MFD. .600 V.	.26
22-196	C32	.01 MFD. .600 V.	.20
22-348	C15	.001 MFD .500 V.	.26
22-365	C24	100 MMFD. (or 22-1670) .500 V.	.20
22-829	C4	.05 MFD. .200 V.	.20
22-830	C21	.02 MFD. .600 V.	.20
22-1041	C38	.005 MFD .400 V.	.20
22-1136	C31	250 MMFD. (or 22-1745) .500 V.	.20
22-1220	C20	.002 MFD .600 V.	.20
22-1256	C28	75 MMFD. (or 22-1746) .500 V.	.20
22-1367	C14	50 MMFD. (Ceramic) .500 V.	.33
22-1385	C19	.01 MFD. .200 V.	.20
22-1506	C8	22 MMFD. (Ceramic) .500 V.	.33
22-1507	C22	25 MMFD. (Ceramic) .500 V.	.33
22-1531	C29	.2 MFD .200 V.	.20
22-1573	C34	40 MFD. Electrolytic .450 V.	2.25
22-1669	C3	100 MMFD (Ceramic) .500 V.	.20
22-1676	C6	.001 MFD (Ceramic) .500 V.	.40
22-1678	C1	Three Gang Variable	4.35
22-1685	C7	Single Section Trimmer	.45
22-1686	C17	Single Section Trimmer	.35
22-1688	C9	19 MMFD. (Ceramic) .500 V.	.30
22-1689	C13	48 MMFD. (Ceramic) .500 V.	.30
22-1691	C16	55 MMfD. (Silver on Ceramic)	.30
22-1705	C5	30 MMFD. (Ceramic) .500 V.	.20
22-1706	C10	.005 MMFD. (Ceramic) (Disc Type) .450 V.	.30
22-1717	C18	.001 MFD .200 V.	.20
22-1718	C27	.01 MFD. (Shielded) .400 V.	.40
22-1720	C35,36,37	Three Section Electrolytic 40 MFD.-25V x 40-40 MFD..450 V.	3.85
22-1754	C39	.0022 MFD. .600 V.	.26
		RESISTORS	
63-957	R4	33M Ohm (Insulated) .1 W.	.24
63-1369	R28	270 Ohm (Insulated) W. W .1 W.	.24
63-1566	R21	22M Ohm (Insulated) .2 W.	.33
63-1588	R30	Volume Control & switch	1.81
63-1589	R37,B8	Two Section Candohm	.60
63-1722	R33	33 Ohm (Insulated) ½ W.	.21
63-1737	R2	68 Ohm (Insulated) ½ W.	.21
63-1768	R34	390 Ohm (Insulated) ½ W.	.21
63-1771	R5	470 Ohm (Insulated) 10% ½ W.	.21
63-1772	R7	470 Ohm (Insulated) 20% ½ W.	.21
63-1778	R32	680 Ohm (Insulated) ½ W.	.21
63-1800	R10	2200 Ohm (Insulated) ½ W.	.21

PARTS LIST

PART NO.	REF.NO.	DESCRIPTION		PRICE
		DIAL ASSEMBLY		
12-1546		Indicator Socket Bracket		.02
26-419		Dial Scale		1.00
46-780		Tone Control Knob		.10
46-781		Tone Control Knob (W Model Only)		.10
46-807		Band Switch Knob		
46-808		Band Switch Knob (W Model Only)		
46-809		Tuning & Volume Control Knob		
46-810		Tuning & Volume Control Knob (W Model Only)		
59-146		Dial Pointer		.24
76-568		Tuning Control Shaft		
78-585		Indicator Socket		.20
80-402		Dial Cord Tension Spring		.03
80-444		Tuner Arm Tension Spring		.05
80-580		Tuner Arm Stop Spring		.06
80-581		Tuner Arm Pressure Spring		.10
93-35		.032 x .144 x 3/8 Steel Washer N. P. (2 Used on 26-419)		.25C
93-719		.031 x 3/16 x 7/16" Steel Washer Cad. (1 Used on 26-419)		.35C
93-729		.032 x .187 x 5/8" Steel Washer (1 Used on 26-419)		
93-774		Felt Washer Brown (Used on Knobs)		
93-956		1/16 x 9/32 x 3/4" Black Felt Washer (59-146)		.01
100-105	PL-1	Neon Indicator Bulb		.11
114-51		#6-32 x 1/2" Hex. Slotted Hd. M.S. Steel (1 Used on 26-419)		
114-271		#6 x 1/2" Hex. Hd. Sl. S.T. (Used on 26-419)		.01
188-32		Retaining Ring (Used on 76-568)		1.03C
199-35		Dial Scale Spacer Sleeve		.05
S-14523		Tuning Shaft Bracket & Insulator Strip Assem.		.20
S-14524		Condenser Pulley & Cam Assembly		.55
S-14525		Tuner Arm Assembly		.75
S-16153		Dial Cord & Eyelet Assembly		
		COILS & CHOKES		
95-1102	T2B	2nd. I. F. Trans. (Broadcast)		1.60
95-1150	T2A	2nd. I. F. Trans. (F.M.)		1.50
95-1153	T4	Disc. Trans.		1.50
S-13871	L3	F.M. Detector Coil Assembly		.75
S-14509	L14	3rd. I.F. Coil Assembly		2.50
S-15690	L2	F.M. Antenna Coil Assembly		
S-15694	L5	Broadcast Osc. Coil Assembly		
S-15695	T1	1st. I.F. Trans. Assembly		
S-15733	L4	F.M. Osc. Coil Assembly		.55
		CONDENSERS		
22-3	C4	.01 Mfd. Ceramic	500 V.	.26
22-229	C18	.005 Mfd.	600 V.	.20
22-448	C25	.004 Mfd.	600 V.	.20
22-829	C10	.05 Mfd.	200 V.	.20
22-830	C16	.02 Mfd.	600 V.	.20
22-854	C17	500 Mmfd.	600 V.	.20
22-887	C15	.001 Mfd.	600 V.	.20
22-1017	C24	.05 Mfd.	600 V.	.20
22-1025	C21	.15 Mfd.	200 V.	.20
22-1126	C19	.01 Mfd.	400 V.	.20
22-1158	C20	.05 Mfd.	200 V.	.20
22-1220	C11	.002 Mfd.	600 V.	.20
22-1367	C9	50 Mmfd. Ceramic	500 V.	.33
22-1506	C7	22 Mmfd. Ceramic	500 V.	.33
22-1507	C13	25 Mmfd. Ceramic	500 V.	.33
22-1669	C12	100 Mmfd. Ceramic	500 V.	.20
22-1676	C5	.001 Mfd. Ceramic	500 V.	.40
22-1742	C1	Two Section Variable		3.00
22-1757	C22,C23	Elect. 80-40 Mfd.	150 V.	2.50
22-1766	C8	.68 Mmfd. Ceramic	500 V.	.20
22-1768	C14	30 Mmfd. Ceramic	500 V.	.20
22-1852	C26	7.5 Mmfd. Ceramic	500 V.	.35

PART NO.	REF.NO.	DESCRIPTION	PRICE
		RESISTORS	
63-686	R15	150 Ohm W.W. 1/2 W. 10% Ins. Res.	.21
63-1223	R8	1.0 Ohm W.W. 1/2 W. 10% Ins. Res.	.21
63-1450	R20	22 Ohm W.W. 1 W. 20% Ins. Res.	.24
63-1527	R19	1000 Ohm W.W. 3 W. 20% Ins. Res.	.39
63-1646	R18	Volume Control & Switch	1.81
63-1737	R1	68 Ohm 1/2 W. 20% Ins. Res.	.21
63-1744	R3	100 Ohm 1/2 W. 20% Ins. Res.	.21
63-1758	R2	220 Ohm 1/2 W. 20% Ins. Res.	.21
63-1782	R17	820 Ohm 1/2 W. 10% Ins. Res.	.21
63-1800	R4	2200 Ohm 1/2 W. 20% Ins. Res.	.21
63-1828	R5	10K Ohm 1/2 W. 20% Ins. Res.	.21
63-1835	R11	15K Ohm 1/2 W. 20% Ins. Res.	.21
63-1856	R9	47K Ohm 1/2 W. 20% Ins. Res.	.21
63-1870	R6	100K Ohm 1/2 W. 20% Ins. Res.	.21
63-1876	R12	150K Ohm 1/2 W. 10% Ins. Res.	.21
63-1884	R21	220K Ohm 1/2 W. 20% Ins. Res.	.21
63-1898	R14	470K Ohm 1/2 W. 20% Ins. Res.	.21
63-1912	R10	1 Megohm 1/2 W. 20% Ins. Res.	.21
63-1926	R7	2.2 Megohm 1/2 W. 20% Ins. Res.	.21
63-1940	R13	4.7 Megohm 1/2 W. 20% Ins. Res.	.21
63-2008	R16	Tone Control	1.20
		MISCELLANEOUS	
12-1070		Wavemagnet Mounting Bracket	.25
14-861		Cabinet for 7H922 White	
14-1122		Cabinet for 7H922	
43-165		Handle Housing	1.00
49-634	SP-1	5 1/4" P.M. Speaker	8.25
		208-634 Cone & Voice Coil Assembly	1.73
		206-634 Output Trans.	1.97
54-139		3/8-32 x 9/16" Palnut Type 9N (1 ea. Used 63-1646 & 85-430)	.008
54-226		Speed Nut-Tinnerman (1 ea. Used S-13871 & S-15733)	.01
57-1269		I. F. Transformer Terminal Plate	.06
57-1486		Cabinet Emblem Plate	.05
58-128		Two Prong Plug	.15
73-30		#6-32 x 1/4" Hex. Hd. Sl. Set Screw Cuppoint	.02
78-787		Two Contact Socket	.10
78-806		Minature Tube Socket	.15
78-807		Minature Tube Socket (4 Used)	.15
78-850		Minature Tube Socket (9 Contact)	.35
78-868		Minature Tube Socket (9 Contact)	
83-1393		Rubber Strip (Handle)	.30
83-1593		Felt Strip (2 Used)	.004
85-430	S-1	Band Switch	1.50
93-415		#6 Ext. Shakeproof Lockwasher (Used on 212-7)	.25C
93-961		Insulator Shoulder Washer (2 Used)	.03
97-293		Chassis Mounting Stud (2 Used)	.18
112-281		#10 x 3/4" Oval Binding Hd. S.T. Screw Stat. Bronze (2 Used)	1.20C
112-697		#6 x 7/16" Straight Side B.H.S.T. Screw (4 Used on Back Mtg.)	.013
114-92		#6 x 1 1/8" Hex. Hd. Sl. S. T. (1 Used on 212-7)	1.50C
114-261		#6 x 3/8" Hex. Hd. Sl. S. T. Screw (2 Used on 43-165)	
126-618		Tube Shield	
149-64		Iron Core & Spring (2 Used)	.40
149-65		Iron Core & Screw	.10
159-50		Cinch Plug Button (4 Used to Mt. 192-117)	.01
192-117		Dial Glass	.75
196-111		Speaker Gasket	.55
199-103		Flexible Handle Sleeve	.35
199-103Y		Flexible Handle Sleeve (W Model Only)	.35
202-697		F.M. Instruction Book	.10
202-722		Instruction Book	
212-7	SE-1	Selenium Rectifier	1.80
S-13210		Strip & Rivet Assembly	.20
S-14527		Wavemagnet Lead & Stop Assembly	.20
S-14548		Cabinet Back Assembly Complete	
S-14957		Wavemagnet Assembly	1.25
S-15325		Cabinet Back Assembly Complete (W Model Only)	2.00

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd. IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

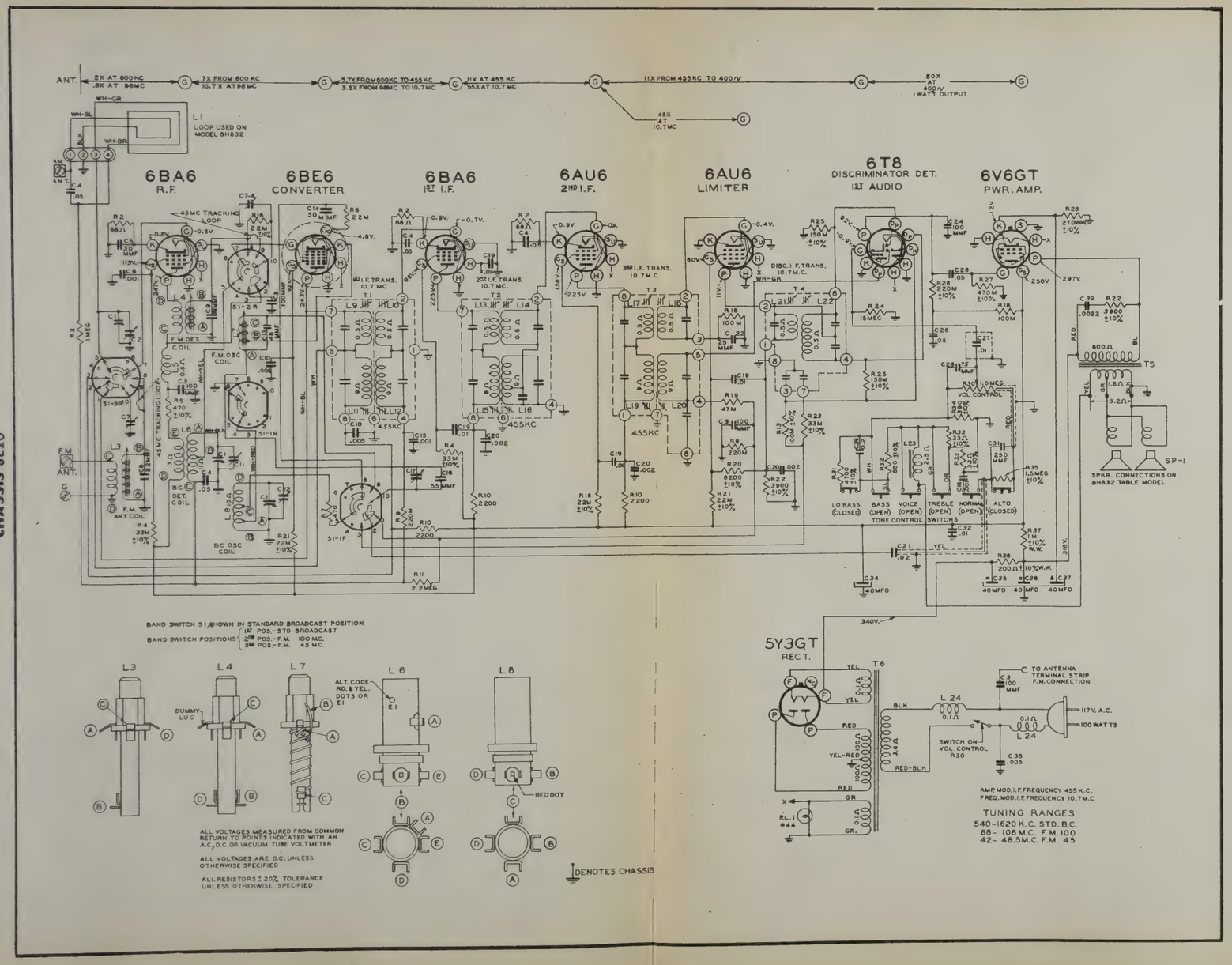
The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

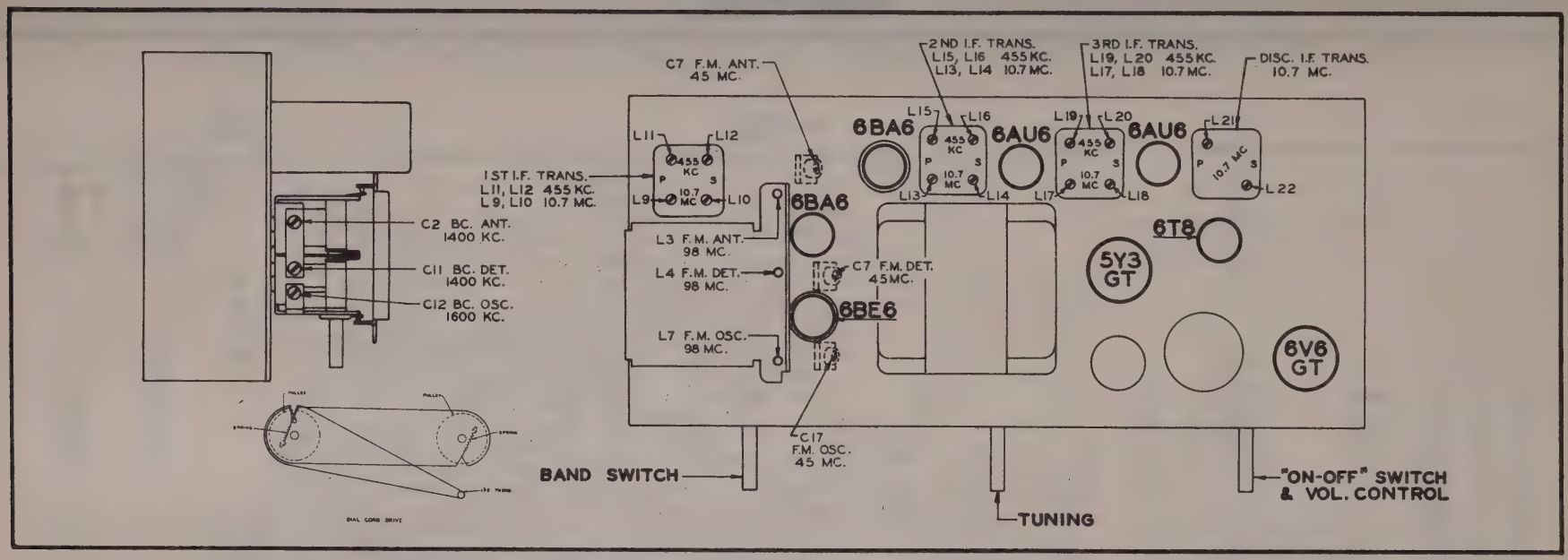
(d) Loosen Slugs by applying a hot iron to the cement.



PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-396		Dial Scale	$0.95
59-209		Dial Pointer	.30
76-498		Pointer Shaft	.08
76-499		Tuning Control Shaft	.25
78-797		Dial Light Socket	.30
80-69		Dial Cord Tension Spring	.02
80-209		Dial Cord Tension Spring	.03
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-581		Tuner Arm Pressure Spring	.10
93-721		Black Felt Dial Washer	.01
100-36	PL-1	Dial Light Bulb Mazda #44	.09
149-64		Tuning Core & Spring	.40
188-32		Retaining Ring (76-499)	1.03C
S-14254		Pointer Pulley Assembly	.25
S-14256		Pulley & Bushing Assembly	.50
S-14268		Dial Cord & Eyelet Assembly (Short)	.05
S-14269		Dial Cord & Eyelet Assembly (Long)	.06
S-14270		Dial Scale & Strip Assembly (26-396)	1.15
S-14429		Tuner Arm Assembly	.80
		COILS AND CHOKES	
S-11157	L8	Broadcast Oscillator Coil Assembly	.53
S-12256	L24	A. C. Line Choke Coil Assembly	.35
S-12259	L7	F. M. Oscillator Coil Assembly	.33
S-13800	L23	Tone Choke Assembly	.60
S-13871	L4	F. M. Detector Coil Assembly	.75
S-13970	T1	1st. I. F. Transformer Assembly	2.50
S-13971	T2	2nd. I. F. Transformer Assembly	2.75
S-13972	T3	3rd. I. F. Transformer Assembly	3.00
S-13973	T4	Discriminator Transformer Assembly	2.00
S-13974	L6	Broadcast Detector Coil Assembly	1.00
S-14126	L5	R. F. Choke Coil Assembly	.35
S-14192	L3	F. M. Antenna Coil Assembly	.70
		CONDENSERS	
22-171	C26	.05 MFD. .600 V.	.26
22-196	C32	.01 MFD. .600 V.	.20
22-348	C15	.001 MFD .500 V.	.26
22-365	C24	100 MMFD. (or 22-1670) .500 V.	.20
22-829	C4	.05 MFD. .200 V.	.20
22-830	C21	.02 MFD. .600 V.	.20
22-1041	C38	.005 MFD .400 V.	.20
22-1136	C31	250 MMFD. (or 22-1745) .500 V.	.20
22-1220	C20	.002 MFD. .600 V.	.20
22-1256	C28	75 MMFD. (or 22-1746) .500 V.	.20
22-1367	C14	50 MMFD. (Ceramic) .500 V.	.33
22-1385	C19	.01 MFD. .200 V.	.20
22-1506	C8	22 MMFD. (Ceramic) .500 V.	.33
22-1507	C22	25 MMFD. (Ceramic) .500 V.	.33
22-1531	C29	.2 MFD .200 V.	.20
22-1573	C34	40 MFD. Electrolytic .450 V.	2.25
22-1669	C3	100 MMFD. (Ceramic) .500 V.	.20
22-1676	C6	.001 MFD. (Ceramic) .500 V.	.40
22-1678	C1	Three Gang Variable	4.35
22-1685	C7	Single Section Trimmer	.45
22-1686	C17	Single Section Trimmer	.35
22-1688	C9	19 MMFD. (Ceramic) .500 V.	.30
22-1689	C13	48 MMFD. (Ceramic) .500 V.	.30
22-1691	C16	55 MMFD. (Silver on Ceramic)	.30
22-1705	C5	30 MMFD. (Ceramic) .500 V.	.20
22-1706	C10	.005 MMFD. (Ceramic) (Disc Type) .450 V.	.30
22-1717	C18	.001 MFD .200 V.	.20
22-1718	C27	.01 MFD. (Shielded) .400 V.	.40
22-1720	C35, 36, 37	Three Section Electrolytic 40 MFD.-25V x 40-40 MFD. 450 V.	3.85
22-1754	C39	.0022 MFD. .600 V.	.26
		RESISTORS	
63-957	R4	33M Ohm (Insulated) .1 W.	.24
63-1369	R28	270 Ohm (Insulated) W. W .1 W.	.24
63-1566	R21	22M Ohm (Insulated) .2 W.	.33
63-1588	R30	Volume Control & switch.	1.81
63-1589	R37, B8	Two Section Candohm.	.60
63-1722	R33	33 Ohm (Insulated) ½ W.	.21
63-1737	R2	68 Ohm (Insulated) ½ W.	.21
63-1768	R34	330 Ohm (Insulated) ½ W.	.21
63-1771	R5	470 Ohm (Insulated) 10% ½ W.	.21
63-1772	R7	470 Ohm (Insulated) 20% ½ W.	.21
63-1778	R32	680 Ohm (Insulated) ½ W.	.21
63-1800	R10	2200 Ohm (Insulated) ½ W.	.21

MODELS 8H832 and 8H861
CHASSIS 8E20


C7 F.M. ANT. 45 MC.
2ND I.F. TRANS. L15, L16 455 KC. L13, L14 10.7 MC.
3RD I.F. TRANS. L19, L20 455 KC. L17, L18 10.7 MC.
DISC. I.F. TRANS. 10.7 MC.
1ST I.F. TRANS. L11, L12 455 KC. L9, L10 10.7 MC.
C2 BC. ANT. 1400 KC.
C11 BC. DET. 1400 KC.
C12 BC. OSC. 1600 KC.
L3 F.M. ANT. 98 MC.
L4 F.M. DET. 98 MC.
L7 F.M. OSC. 98 MC.
C7 F.M. DET. 45 MC.
C17 F.M. OSC. 45 MC.
6BA6
6AU6
6AU6
6BA6
6BE6
6T8
5Y3 GT
6V6 GT
BAND SWITCH
TUNING
"ON-OFF" SWITCH & VOL. CONTROL
DIAL CORD DRIVE

TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 8E20 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

The Radiorgan tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms.. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alighment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z800I) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1096. Be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

Part No.	Description	Price

9H981 LP (Chassis 9E21) is the same as 9H881 (Chassis 9E21) except the following:

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H982R LP (Chassis 9E21) is the same as 9H882R (Chassis 9E21) except the following:

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Record Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H985 LP (Chassis 9E21) is the same as 9H885 (Chassis 9E21) except the following:

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H985R LP (Chassis 9E21) is the same as 9H885R (Chassis 9E21) except the following:

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Record Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H988R LP (Chassis 9E21) is the same as 9H888R (Chassis 9E21) except the following:

Part No.	Description	Price

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Record Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H985 LP (Z) (Chassis 9E21Z)

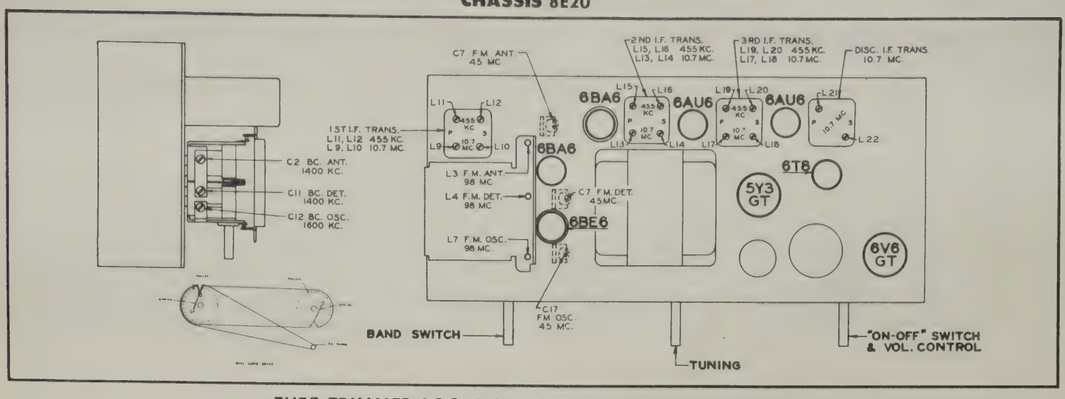
Same as 9H885 (Chassis 9E21) except:

OMIT:

x11-106	Line Cord Plug	
x22-196	.01 Mfd. 600V	
x22-327	.02 Mfd. 200V	
x22-1685	Single Section Trimmer	
x22-1686	Single Section Trimmer	
x22-1688	19 Mmfd. (Ceramic) 500V	
x22-1691	55 Mmfd. (Silver on Ceramic)	
x22-1719	Two Section Electrolytic 15-40 Mfd. 450V	
x26-396	Dial Scale (use S-14270)	
x57-1336	Dial Escutcheon	
x63-1841	22K ohm 1/2W 10% Ins. Res.	
x63-1939	4.7 Megohm 1/2W 10% Ins. Res.	
70-96	#10x1-3/4" R.H.W.S. Steel N.P. (6 used)	
83-1244	Record Changer Trim Strip	
x85-424	Band Switch	
114-257	#10x1-3/8" Hex Slotted Washer Hd. Sheet Metal Screw	
202-506	F.M. Instruction Book	
202-566	Instruction Book	
S-14002	Intermixer Record Changer Assy.	
xS-14126	R.F. Choke Coil Assy.	
xS-14270	Dial Scale & Strip Assy. (26-396)	
S-14433	Chassis Comp. Hinge Assy. (R.H.)	
S-14434	Chassis Comp. Hinge Assy. (L.H.)	

ADD:

x11-108	Line Cord & Plug (9 ft. lg.)	.80
x19-171	Connector Clip (2 used)	.02
x22-1418	0.1 Mfd. 200V	.20
x22-1489	10 Mmfd. (Ceramic) 500V	.23
x22-1505	17 Mmfd. (Ceramic) 500V	.33
x22-1884	Two Section Elec. 40 Mfd.-350V 40 Mfd.-450V	3.50
x26-418	Dial Scale (use S-15394)	
x57-1269	I.F. Transformer Terminal Plate	.06
x57-1471	Dial Escutcheon	6.50
x63-1198	10K ohm 2W 10% Ins. Res.	.36


C7 F.M. ANT. 45 MC.
2ND I.F. TRANS. L15, L16 455 KC. L13, L14 10.7 MC.
3RD I.F. TRANS. L19, L20 455 KC. L17, L18 10.7 MC.
DISC. I.F. TRANS. 10.7 MC.
1ST I.F. TRANS. L11, L12 455 KC. L9, L10 10.7 MC.
C2 BC. ANT. 1400 KC.
C11 BC. DET. 1400 KC.
C12 BC. OSC. 1600 KC.
L3 F.M. ANT. 98 MC.
L4 F.M. DET. 98 MC.
L7 F.M. OSC. 98 MC.
C7 F.M. DET. 45 MC.
C17 F.M. OSC. 45 MC.
6BA6
6AU6
6BE6
6T8
5Y3 GT
6V6 GT
BAND SWITCH
TUNING
"ON-OFF" SWITCH & VOL. CONTROL

TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 8E20 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

The Radiorgan tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z800I) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1096. Be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 6BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L-11, 12, 15, 16, 19 and 20.	Align I. F. channel for maximum output
2	2 turns loosely cpld. to wavemagnet.		1600 Kc. Modulated	BC	1600 Kc.	C12	Set oscillator to dial scale.
3			1400 Kc. Modulated	BC	1400 Kc.	C11 and C2	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 6AU6 Limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 45		L21 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)		.05 Mfd.	10.7 Mc Unmodulated	FM 45		L22 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6AU6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L17 and L18 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BA6 1st IF.	.05 Mfd	10.7 Mc Unmodulated	FM 45		L13 and L14 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 6BE6 converter tube	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L9 and L10 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
9 (c)(d)	FM Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c)(d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 and L3 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.
11 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C17	Set oscillator to dial scale.
12 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C7 Det., C7 Ant.	Align detector and ant. stages for maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).

(d) Loosen Slugs by applying a hot iron to the cement.

PART NO.	REF. NO.	DESCRIPTION		PRICE
		RESISTORS--Continued		
63-1810	R22	3900 Ohm	(Insulated)	$0.21
63-1813	R31	4700 Ohm	(Insulated)	.21
63-1824	R20	22K Ohm	(Insulated) 10%	.21
63-1842	R6	22K Ohm	(Insulated) 20%	.21
63-1848	R23	33K Ohm	(Insulated)	.21
63-1856	R19	47K Ohm	(Insulated)	.21
63-1869	R13	100K Ohm	(Insulated) 10%	.21
63-1870	R18	100K Ohm	(Insulated) 20%	.21
63-1876	R25	150K Ohm	(Insulated)	.21
63-1883	R26	220K Ohm	(Insulated) 10%	.21
63-1884	R9	220K Ohm	(Insulated) 20%	.21
63-1897	R28	470K Ohm	(Insulated)	.21
63-1912	R35	1 Megohm	(Insulated)	.21
63-1926	R11	2.2 Megohm	(Insulated)	.21
63-1961	R24	15 Megohm	(Insulated)	.21
		MISCELLANEOUS		
2-134		Cabinet Back		.75
11-104		Line Cord & Plug (7 ft.)		.65
46-697		Volume & Tuning Control Knob (2 used)		.10
46-718	SP-1	Bandswitch Knob (2 used)		.10
49-641		6" P.M. Speaker (2 used)		6.00
54-30		#8-32 x 5/16" "Hex Nut - Steel - N.P. (4 used)		6.73
54-31		#10-32 x 3/8" x 1/8" Hex Nut (4 used on 95-1062)		.43C
54-139		#3/8-32 x 9/16" Palnut-Cads (used on 63-1588)		.01
54-226		Speed Nut (3 used)		.01
54-262		Speed Nut		.01
57-1353		Diffusing Plate		.90
57-1386		Dial Escutcheon		6.00
70-83		#6 x 3/8" Phillips Flat Hd. Wood Screw (8 used) (Cabt. Back Mtg.)		.55C
72-58		#4 x 3/8" Phillips Flat Hd. Wood Screw (6 used) (Escutcheon Mtg.)		.02
78-250		Eleven Lug Capacitor Socket		.07
78-252		Miniature Tube Socket (2 used)		.25
78-788		Miniature Tube Socket (9 Contact)		.35
78-793		Octal Tube Socket (2 used) (7 Contact)		.15
78-794		Miniature Tube Socket (3 used) (7 Contact)		.20
85-424	S1	Bandswitch		3.60
93-125		#6 Int. Lockwasher (4 used on 95-1062)		.01C
93-127		#10 Int. Lockwasher (4 used on 95-1062)		.02C
93-329		3/32" x 3/16" x 1/32" Brown Felt Washer		1.00
93-719		.031" x 3/16" x 7/16" Steel Washer		.01
95-1062		Output Transformer		13.00
95-1096		Output Transformer		2.50
114-269		#8-32 x 1/4" Hex. Hd. Self Tapping Screw		.55C
114-270		#8-32 x 1-1/8" Hex. Hd. Sledged Hd. M.S. (4 used)		.02
114-292		#6 x 5/8" Hex. Hd. Slotted Self Tapping Screw		.72C
125-62		Rubber Grommet (4 used) (Rubber Feet)		.01
126-46		Rubber Bumper (4 used)		.03
192-115		Dial Dust Gasket		1.50
195-506		F.M. Instruction Book		.75
202-610		Instruction Book		.10
202-611		Wavemagnet Assembly Type 29E		.10
S-14648	L1	Wavemagnet and Back Assembly		1.50
				2.25
		RADIORGAN PARTS		
57-1351		Radiorgan Escutcheon (L.H.)		.50
57-1352		Radiorgan Escutcheon (R.H.)		.50
76-444		Radiorgan Knob Retaining Shaft (2 Used)		.04
80-1300		Radiorgan Mounting Spring (2 Used)		.05
S-14255		Tone Choke Assembly		.60
S-14259		Radiorgan Mounting Bracket Assembly (2 Used)		.15
S-14260		Radiorgan Strip and Contact Assembly (R.H.)		.15
S-14261		Radiorgan Strip and Contact Assembly (L.H.)		.15
S-14273		Radiorgan Knob and Eyelet Assembly (Lo-Bass)		.20
S-14274		Radiorgan Knob and Eyelet Assembly (Voice)		.20
S-14275		Radiorgan Knob and Eyelet Assembly (Treble)		.20
S-14276		Radiorgan Knob and Eyelet Assembly (Alto)		.20
S-14277		Radiorgan Knob and Eyelet Assembly (Normal)		.20
S-14278		Radiorgan Escutcheon and Knob Assembly (L. H.) (Lo-Bass, Voice)		1.50
S-14310		Radiorgan Escutcheon and Knob Assembly (R.H.) (Treble, Alto, Normal)		1.50

25M-648-CPC

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Part No.	Description	Price

9H981 LP (Chassis 9E21) is the same as 9H881 (Chassis 9E21) except the following:

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H982R LP (Chassis 9E21) is the same as 9H882R (Chassis 9E21) except the following:

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Record Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H985 LP (Chassis 9E21) is the same as 9H885 (Chassis 9E21) except the following:

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H985R LP (Chassis 9E21) is the same as 9H885R (Chassis 9E21) except the following:

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Record Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H988R LP (Chassis 9E21) is the same as 9H888R (Chassis 9E21) except the following:

Part No.	Description	Price

OMIT:

S-14002	Intermixer Record Changer	

ADD:

S-14009	Dual Speed Intermixer Record Changer (or S-14013)	
202-679	Supplementary Instruction Book	.07

9H985 LP (Z) (Chassis 9E21Z)

Same as 9H885 (Chassis 9E21) except:

OMIT:

x11-106	Line Cord Plug	
x22-196	.01 Mfd. 600V	
x22-327	.02 Mfd. 200V	
x22-1685	Single Section Trimmer	
x22-1686	Single Section Trimmer	
x22-1688	19 Mmfd. (Ceramic) 500V	
x22-1691	55 Mmfd. (Silver on Ceramic)	
x22-1719	Two Section Electrolytic 15-40 Mfd. 450V	
x26-396	Dial Scale (use S-14270)	
x57-1336	Dial Escutcheon	
x63-1841	22K ohm 1/2W 10% Ins. Res.	
x63-1939	4.7 Megohm 1/2W 10% Ins. Res.	
70-96	#10x1-3/4" R.H.W.S. Steel N.P. (6 used)	
83-1244	Record Changer Trim Strip	
x85-424	Band Switch	
114-257	#10x1-3/8" Hex Slotted Washer Hd. Sheet Metal Screw	
202-506	F.M. Instruction Book	
202-566	Instruction Book	
S-14002	Intermixer Record Changer Assy.	
xS-14126	R.F. Choke Coil Assy.	
xS-14270	Dial Scale & Strip Assy. (26-396)	
S-14433	Chassis Comp. Hinge Assy. (R.H.)	
S-14434	Chassis Comp. Hinge Assy. (L.H.)	

ADD:

x11-108	Line Cord & Plug (9 ft. lg.)	.80
x19-171	Connector Clip (2 used)	.02
x22-1418	0.1 Mfd. 200V	.20
x22-1489	10 Mmfd. (Ceramic) 500V	.23
x22-1505	17 Mmfd. (Ceramic) 500V	.33
x22-1884	Two Section Elec. 40 Mfd.-350V 40 Mfd.-450V	3.50
x26-418	Dial Scale (use S-15394)	
x57-1269	I.F. Transformer Terminal Plate	.06
x57-1471	Dial Escutcheon	6.50
x63-1198	10K ohm 2W 10% Ins. Res.	.36

Part No.	Description	Price
x63-1911	1 Megohm 1/2W 10% Ins. Res.	.21
x63-1970	3300 ohm 2W 20% Ins. Res.	.33
70-83	#6x1/2" Washer Hd. Wood Screw Steel Stat. Bronze (8 used)	.55C
78-798	Seven Contact Socket (Inter-Conn. Cable)	.20
83-1246	Record Changer Trim Strip	.60
x85-447	Band Switch	2.75
x93-721	Black Felt Washer (used on 59-209)	.01
114-314	#10x1-1/16" Hex Sl. Washer Hd. S.T. Type Z Cad. (2 used)	.03
202-686	Instruction Book	.15
S-11918	Chassis Comp. Hinge. Assy (R.H.)	1.06
S-11919	Chassis Comp. Hinge Assy. (L.H.)	1.06
S-14009	Dual Speed Intermixer Record Changer	
xS-15394	Dial Scale & Strip Assy. (26-418)	1.15

MODEL 9H985LP (Z1) (Chassis 9E21Z)

CABINET PARTS

S-11918	Chassis Comp. Hinge Assy. (R.H.)	1.06
S-11919	Chassis Comp. Hinge Assy. (L.H.)	1.06
S-12329	Chassis Mtg. Strip & Stud Assy. (2 used)	.45
S-14012	Non-Intermixer Dual Speed Changer	
S-14195	Loop Loading Coil Assy.	.70
S-14305	Low Impedance Loop Assy.	.45
S-14532	Record Changer Comp. Hinge.(L.H.)	2.50
S-14557	Record Changer Mtg. Frame Assy.	3.50
S-15469	Interconnecting Cable Assy.	3.50
S-15561	Record Changer Comp. Hinge Assy. (R.H.)	2.50
12-1547	Tone Arm Rest Brkt.	.06
15-82	Plug Cap & Insulator (used on S-15469)	.10
19-9	Cable Clip	.03
19-169	Record Changer Mtg. Clip (4 used)	.07
19-171	Connector Clip (2 used on S-14305)	.02
40-42	Knife Hinge (R.H.)	.25
40-65	Knife Hinge (L.H.)	.25
46-662	Key Escutcheon (2 used)(Lower Doors)	.70
46-697	Tuning Control Knob (2 used)	.10
46-718	Band Switch Knob	.15
46-725	Door Pulls (2 used)(Upper Doors)	.75
46-726	Phono Switch Knob (2 used)	.10
49-624	12" P.M. Speaker	13.00
	208-624 Cone & Voice Coil	4.60
57-1284	Strike Plate	.05
57-1353	Diffusing Plate	.90
57-1471	Dial Escutcheon	6.50
58-169	Seven Prong Plug	.20
70-3	#5x1/2" R.H.W.S. Steel N.P. (used on 19-9)	.85C
70-83	#6x1/2" Washer Hd. Wood Screw Steel Bronze (4 used)	.55C
72-58	#2x3/8" Phillips Flad Hd. Wood Screw-Brass Plate (6 used on 57-1471)	.02
78-750	Six Contact Socket (For S-15469)	.25
80-423	Chassis Lift Spring (2 used)	.21
80-604	Hinge Spring	.15
80-678	Record Changer Mtg. Spring	.04
83-1245	Record Changer Trim Strip	1.00
93-392	3/32"x33/64"x 1" Brown Felt Washer (3 used)	1.20C
112-712	Record Changer Mtg. Screw (4 used)	.08
113-17	6-32x1/4" R.H.M.S. Steel N.P. #6 Int. Shakeproof Lockwasher attached screw (2 used on 12-1547)	.02
125-49	Rubber Grommet	.05
156-35	Bullet Catch	.05
159-61	Plug Button-Statuary Bronze	.15
165-9	Metal Glides (4 used)	.03
192-115	Dial Glass	1.50
196-109	Dial Dust Gasket	.75
202-697	F.M. Instruction Book	.10
202-698	Instruction Book (Radio & Phono)	.15

RADIORGAN ESC. PARTS

S-14255	Radiorgan Mtg. Brkt. Assy.	.15
S-14273	Radiorgan Knob & Eyelet Assy. (Lo-Bass)	.20
S-14274	Radiorgan Knob & Eyelet Assy. (Bass)	.20
S-14275	Radiorgan Knob & Eyelet Assy. (Voice)	.20
S-14276	Radiorgan Knob & Eyelet Assy. (Treble)	.20
S-14277	Radiorgan Knob & Eyelet Assy. (Alto)	.20
S-14278	Radiorgan Knob & Eyelet Assy. (Normal)	.20
S-14310	Radiorgan Esc. & Knob Assy. (L.H.)	1.50
S-14311	Radiorgan Esc. & Knob Assy. (R.H.)	1.50
76-444	Radiorgan Knob Retaining Shaft (2 used)	.04
80-595	Radiorgan Mtg. Spring (2 used)	.05
114-321	#6x1/4" Hex Hd. Slotted S.T. Screw Shakeproof Type #1 Cad. (2 used on S-14310 & 2 used on S-14311)	.01

For Chassis Parts refer to 9E21 (Z) Parts List, parts marked "x".

Part No.	Description	Price

MODEL 9H985RLP(Z1) (Chassis 9E21Z)

9H985RLP (Z1) (Chassis 9E21Z) is the same as 9H985LP (Z1) (Chassis 9E21Z) except the following:

OMIT:

46-662	Key Escutcheon (2 used)(Lower Doors)	
46-725	Door Pull (2 used)(Upper Doors)	

ADD:

46-743	Door Pull (2 used)(Upper Doors)	.75
57-1406	Key Escutcheon (2 used)(Lower Doors)	.70
80-648	Anti-Rattle Spring	.01
138-28	Metal Grille (2 used)	4.50

MODEL 9H995 RLP (Z) (Chassis 9E21Z)

CABINET PARTS

S-11918	Hinge Plate & Brkt. Assy. (R.H.)	1.06
S-11919	Hinge Plate & Brkt. Assy. (L.H.)	1.06
S-12329	Chassis Mtg. Strip & Stud Assy. (2 used)	.45
S-14012	Non-Intermixer Dual Speed Record Changer	
S-14195	Loop Loading Coil Assy.	.70
S-14305	Low Impedence Loop Assy.	.45
S-15469	Interconnecting Cable Assy.	3.50
S-15536	Record Changer Compt. Hinge Brkt. & Link Assy.	.50
S-15538	Record Changer Mtg. Frame Assy.	3.10
12-1547	Tone Arm Rest Brkt.	.06
15-82	Plug Cap & Insulator	.10
19-9	Cable Clip	.03
19-169	Record Changer Mtg. Clip (4 used)	.07
19-171	Connector Clip	.02
46-697	Tuning Control Knob (2 used)	.10
46-718	Band Switch Knob	.15
46-726	Phono Switch Knob (2 used)	.10
49-624	12" P.M. Speaker	13.00
	208-624 Cone & Voice Coil	4.60
57-1284	Strike Plate	.05
57-1353	Diffusing Plate	.90
57-1471	Dial Esc.	6.50
58-169	Seven Prong Plug	.20
70-3	#5x1/2" R.H.W.S. Steel N.P. (used on 19-9)	.85C
72-58	#2x3/8" Phill. Flat Hd. Wd. Screw Steel-Brass Pl. (6 used on 57-1471)	.02
78-750	Six Contact Socket	.25
80-423	Chassis Lift Spring (2 used)	.21
80-648	Anti-Rattle Spring (8 used)	.01

Part No.	Description	Price
80-678	Record Changer Mtg. Spring	.04
83-1245	Record Changer Trim Strip	1.00
93-392	3/32"x33/64" x 1" Brown Felt Washer (3 used)	1.20C
112-712	Record Changer Mtg. Screw	.08
113-17	6-32 x 1/4 R. H. M. S. Steel N.P. #6 Int. Shakeproof Lockeasher (2 used on 12-1547)	.02
114-321	#6x1/4" Hex. Hd. Slotted S. T. Screw Shakeproof Type #1 Cad. (2 used on S-14310 & 2 used on S-14311)	.01
125-49	Rubber Grommet (4 used)	.05
156-35	Bullet Catch (2 used)	.05
159-61	Plug Button	.15
165-9	Metal Glides (2 used)	.03
165-14	Metal Glides (2 used)	.03
192-115	Dial Glass	1.50
196-109	Dial Dust Gasket	.75
202-697	F. M. Instruction Book	.10
202-698	Instruction Book (Radio & Phono)	.15

RADIORGAN ESC. PARTS

S-14255	Radiorgan Mtg. Brkt. Assy. (2 used)	.15
S-14273	Radiorgan Knob & Eyelet Assy. (Lo-Bass)	.20
S-14274	Radiorgan Knob & Eyelet Assy. (Bass)	.20
S-14275	Radiorgan Knob & Eyelet Assy. (Voice)	.20
S-14276	Radiorgan Knob & Eyelet Assy. (Treble)	.20
S-14277	Radiorgan Knob & Eyelet Assy. (Alto)	.20
S-14278	Radiorgan Knob & Eyelet Assy. (Normal)	.20
S-14310	Radiorgan Esc. & Knob Assy. (L.H.)	1.50
S-14311	Radiorgan Esc. & Knob Assy. (R.H.)	1.50
76-444	Radiorgan Knob Retaining Shaft (2 used)	.04
80-595	Radiorgan Mtg. Spring	.05

For Chassis Parts refer to 9E21 (Z) Parts List, parts marked "x".

MODEL 9H995RLP (Z1) (Chassis 9E21Z)

CABINET PARTS

S-11918	Hinge Plate & Brkt. Assy. (Radio) R.H.	1.06

Part No.	Description	Price
S-11919	Hinge Plate & Brkt. Assy. (Radio) L.H.	1.06
S-12329	Chassis Mtg. Strip & Stud Assy.	.45
S-14021	Non-Intermixer Record Changer	
S-14195	Loop Loading Coil Assy.	.70
S-14305	Low Impedence Loop Assy.	.45
S-15469	Interconnecting Cable Assy.	3.50
S-15536	Record Changer Comp. Hinge Brkt. & Link Assy. (2 used)	.50
S-15538	Record Changer Mtg. Frame Assy.	3.10
S-15780	Cobra Tone Arm Cartridge Assy.	
15-82	Plug Cap & Insulator	.10
19-9	Cable Clips	.03
19-169	Record Changer Mtg. Clip (4 used)	.07
19-171	Connector Clip (2 used on S-14305)	.02
46-697	Tuning Control Knob (2 used)	.10
46-718	Band Switch Knob	.15
46-726	Phono Switch Knob	.10
49-624	12" P.M. Speaker	13.00
	208-624 Cone & Voice Coil	4.60
57-1284	Strike Plate	.05
57-1353	Diffusing Plate	.90
57-1471	Dial Esc.	6.50
58-169	Seven Prong Plug (used on S-15469)	.20
70-3	#5x1/2" R.H.W.S. Steel N.P. (1 used on 19-9)	.85C
72-58	#2x3/8" Phill. F.H. Steel Brass Plate (6 used to mt. 57-1471)	.02
78-750	Six Contact Socket	.25
80-423	Chassis Lift Spring	.21
80-678	Record Changer Mtg. Spring (4 used)	.04
83-1245	Record Changer Trim Strip	1.00
93-392	3/32"x 33/64" x 1" Brown Felt Washer (3 used)	1.20C
112-712	Record Changer Mtg. Screw (4 used)	.08
125-49	Rubber Grommet (4 used)	.05
156-35	Bullet Catch (2 used)	.05
159-61	Plug Button - Statuary Bronze	.15
165-9	Metal Glides (2 used)	.03
165-14	Metal Glides (2 used)	.03
192-115	Dial Glass	1.50
196-109	Dial Dust Gasket	.75
202-697	F.M. Instruction Book	.10
202-737	Instruction Book (Radio & Phono)	.30

RADIORGAN ESC. PARTS

S-14255	Radiorgan Mtg. Brkt. Assy.	.15
S-14273	Radiorgan Knob & Eyelet Assy. (Lo-Bass)	.20
S-14274	Radiorgan Knob & Eyelet Assy. (Bass)	.20
S-14275	Radiorgan Knob & Eyelet Assy. (Voice)	.20
S-14276	Radiorgan Knob & Eyelet Assy. (Treble)	.20
S-14277	Radiorgan Knob & Eyelet Assy. (Alto)	.20
S-14278	Radiorgan Knob & Eyelet Assy. (Normal)	.20
S-14310	Radiorgan Esc. & Knob Assy. (L.H.)	1.50
S-14311	Radiorgan Esc. & Knob Assy. (R.H.)	1.50
76-444	Radiorgan Knob Retaining Shaft	.04
80-595	Radiorgan Mtg. Spring (2 used)	.05
114-321	#6x1/4 Hex Hd. Slotted S. T. Screw (2 used on S-14310 & 2 used on S-14311)	.01

For Chassis Parts refer to 9E21 (Z) Parts List, parts marked "x".

MODEL 9H995RLP (Z2) (Chassis 9E21Z)

9H995RLP (Z2) is the same as 9H995RLP(Z1), except the following:

OMIT:

19-169	Record Changer Mtg. Clip (4 used)
80-678	Record Changer Mtg. Spring (4 used)
83-1245	Record Changer Trim Strip
112-712	Record Changer Mtg. Screw (4 used)
202-737	Instruction Book (Radio& Phono)
S-14021	Non-Intermixer Record Changer
S-15538	Record Changer Mtg. Frame Assy.

ADD:

202-760	Instruction Book (Radio & Phono)	.40
S-14022	3 Speed Non-Intermixer Record Changer	
S-16196	Record Changer Mtg. Frame & Arm Assembly	8.00

MODEL 12H990 LP (Chassis 11C21)

12H990LP is the same as 12H090 (Z) except the following:

OMIT:

S-14006	Intermixer Record Changer

ADD:

S-14015	Dual Speed Intermixer Record Changer (or S-14010)
202-679	Supplementary Instruction Sheet .07

Part No.	Description	Price

12H991E LP (Chassis 11C21) is the same as 12H091E (Chassis 11C21) except the following:

OMIT:

S-14006 Intermixer Record Changer

ADD:

S-14010 Dual Speed Intermixer Record Changer (or S-14015)
202-679 Supplementary Instruction Book .07

12H992R LP (Chassis 11C21) is the same as 12H092R (Z) (Chassis 11C21) except the following:

OMIT:

S-14006 Intermixer Record Changer

ADD:

S-14010 Dual Speed Intermixer Record Changer (or S-14015)
202-679 Supplementary Instruction Sheet .07

12H993R LP (Chassis 11C21) is the same as 12H093R (Chassis 11C21) except the following:

OMIT:

S-14006 Intermixer Record Changer

ADD:

S-14010 Dual Speed Intermixer Record Changer (or S-14015)
202-679 Supplementary Instruction Sheet .07

12H994GO LP (Chassis 11C21) is the same as 12H094GO (Z) (Chassis 11C21) except the following:

OMIT:

S-14006 Intermixer Record Changer

ADD:

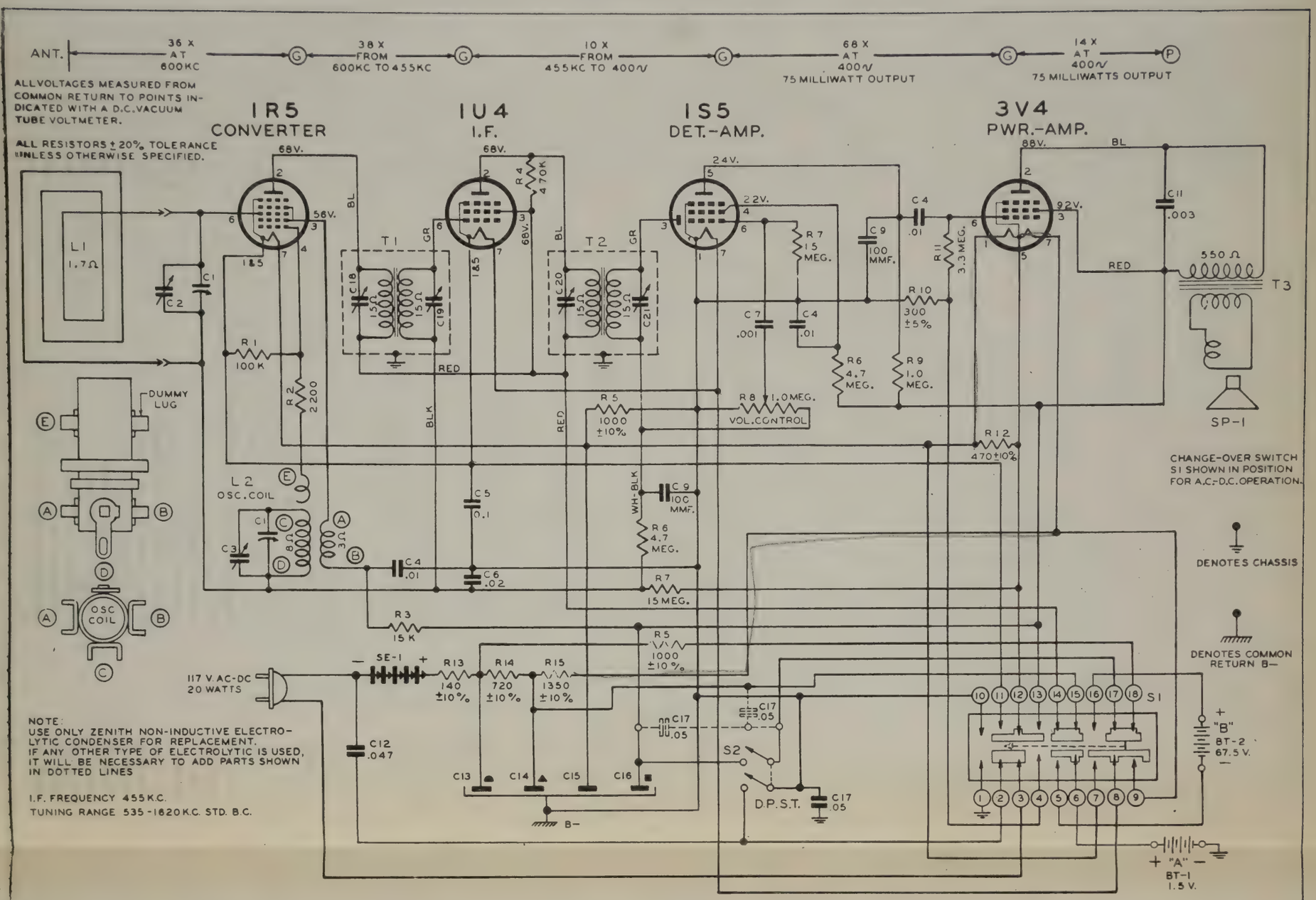
S-14010 Dual Speed Intermixer Record Changer (or S-14015)
202-679 Supplementary Instruction Book .07

PARTS LIST

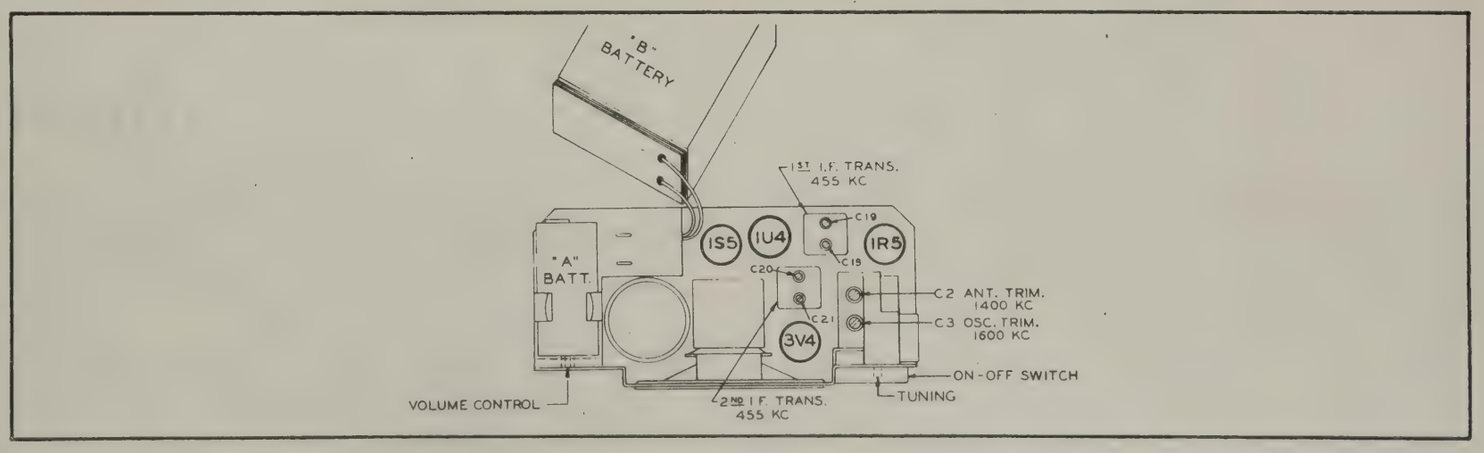
DIAG. NO.	DESCRIPTION		PRICE
	DIAL ASSEMBLY		
	Volume Control Mtg. Brkt.		$ .08
	Front Cover Latch Knob		.35
	Tuning Control Knob		.06
	Tuning Control Knob (W & Y Model only)		.06
	"On-Off" Switch Knob		.05
	"On-Off" Switch Knob (Y Model only)		.05
	"On-Off" Switch Knob (W Model only)		.05
	Volume Control Knob		.10
	Volume Control Knob (W & Y Model only)		.10
	Dial Pointer		.10
	COILS & CHOKES		
T1	1st I.F. Transformer		2.50
T2	2nd I.F. Transformer		2.50
L2	Osc. Coil Assembly		.55
	CONDENSERS		
C4	.01 Mfd. Ceramic (Disc)	500V	.26
C11	.003 Mfd.	400V	.20
C5	.1 Mfd.	200V	.23
C17	.05 Mfd.	200V	.20
C6	.02 Mfd.	200V	.20
C1	Two Section Variable Cond.		4.00
C9	100 Mmfd. Ceramic	500V	.20
C7	.001 Mfd. (Molded) (or 22-1343)	500V	.40
C12	.047 Mfd. (Molded) (or 22-1756) (or 22-1914)	400V	.26
C13,14	Four Section Elect. 40-40-20 Mfd.		
C15,16	150V - 200 Mfd. 10V		3.25
	RESISTORS		
R8	Volume Control		1.20
R10	300 Ohm 1/2W 5% Ins. Res.		.21
R12	470 Ohm 1/2W 10% Ins. Res.		.21
R5	1000 Ohm 1/2W 10% Ins. Res.		.21
R2	2200 Ohm 1/2W 20% Ins. Res.		.21
R3	15K Ohm 1/2W 20% Ins. Res.		.21
R1	100K Ohm 1/2W 20% Ins. Res.		.21
R4	470K Ohm 1/2W 20% Ins. Res.		.21
R9	1 Megohm 1/2W 20% Ins. Res.		.21
R11	3.3 Megohm 1/2W 20% Ins. Res.		.21
R6	4.7 Megohm 1/2W 20% Ins. Res.		.21
R7	15 Megohm 1/2W 20% Ins. Res.		.21
R13	140 Ohm 3W (Zipohm) 10% Ins. Res. (or 63-2014)		.33
R14,15	Two Section Candohm		.75
	MISCELLANEOUS		
	Line Cord & Plug		.65
	Handle Support Brkt. (R.H.)		.07
	Handle Support Brkt. (L.H.)		.07
	Cabinet for 4G800		2.00
	Cabinet for 4G800 (Black)		2.00
	Cabinet for 4G800 (White)		2.00
	"A" Battery Retaining Clip		.12
	Switch Cover		.08
	Wavemagnet Cover		.50
	Wavemagnet Cover (Y Model only)		.50
	Wavemagnet Cover (W Model only)		.50
	Cabinet Cover		1.10
	Cabinet Cover (Y Model only)		1.10
	Cabinet Cover (W Model only)		1.10
	Handle End Pieces (2 used)		1.25
SP1	3-1/2" P.M. Speaker		4.25
	208-665 Cone & Voice Coil		1.65

MODELS G402, G402Y, G402W & G402G

CHASSIS 4G41



TUBE AND TRIMMER LOCATION



TO THE SERVICEMAN:

Final alignment of the 4G41 chassis should be made with the chassis installed in the cabinet. Tune in a weak station in the vicinity of 1400 KC and adjust the antenna trimmer for maximum.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Sig. Frequency	Set Dial At	Trimmers	Purpose
1	Converter Grid	1 MFD	455 Kc.	600 Kc.	C18, C19, C20, C21	Align I.F.
2	One Turn Loosely		1600 Kc.	1600 Kc.	C3	Set Oscillator To Scale --
3	Coupled to Wavemagnet		1400 Kc.	1400 Kc.	C2	Adjust for Maximum.

PART NO.	DIAG. NO.	DESCRIPTION	PRICE
		MISCELLANEOUS Cont'd	
54-254		Speed Nut - Tinnerman (3 used on 83-1416)	.85C
57-1314		Cabinet Front Plate	3.00
57-1315		Chassis Bottom Plate	.50
78-274		Elect. Cond. Socket	.03
78-781		Miniature Tube Socket	.20
78-782		Miniature Tube Socket	.25
80-564		"B" Battery Retaining Spring	.06
80-567		Latch Spring	.02
80-611		Latch Spring	.03
80-612		"A" Battery Front Contact Spring	.03
83-1416		Decorative Strip	.60
83-1417		Rubber Strip - Handle	.10
83-1428		Wavemagnet Retaining Strip	.03
83-1513		"B" Battery Terminal Strip	.25
85-433	S2	On-Off Switch	1.20
85-454	S1	Power Change-Over Switch	2.00
93-870		Fibre Shoulder Washer	.02
93-935		.015 x 7/16" x 3/4" Armite Washer	.01
94-295		Gang Cond. Mtg. Bushing (3 used)	.04
95-1014	T3	Output Transformer	1.65
110-127		Grill Cloth	.15
112-56		#6 x 1/4" Hex Hd. S.T. Screw Cad. (3 used S-15482, 2 used 126-539)	.55C
112-322		#2 x 3/16" Phill. Oval Hd. S.T. Screw (4 used on Wavemagnet & Cover)	.03
112-407		#6 x 3/8" Rd. Hd. S.T. Screw Cad. Pl. (2 used to mount ea. 43-149)	.02
112-685		#4 x 3/16" Flt. Hd. S.T. Screw Cad. (4 used on Wavemagnet & Cover)	.02
112-711		#4 x 1/4" B.H. S.T. Screw Stat. Br. (8 used)	1.20C
113-17		#6-32 x 1/4" R.H. M.S. Steel N.P. (2 used Chassis Mtg.)	.02
114-58		#6-32 x 3/8" Hex Hd. MS Steel (3 used 22-1457)	.43C
125-17		Rubber Grommet (3 used 22-1457)	.03
125-58		Strain Relief Grommet	.15
125-59		Strain Relief Grommet	.15
126-539		Volume Control & Power Switch Shield	.15
199-79		Flexible Handle Sleeve	.30
199-79Y		Flexible Handle Sleeve (Y & W Model only)	.30
202-757		Instruction Book	.20
212-5	SE1	Selenium Rectifier	1.80
S-13777		Power Switch Shield Assembly	.20
S-13786	L1	Wavemagnet Winding Assembly	.75
S-13848		Hinge & Wire Assembly (R.H.)	.50
S-13849		Hinge & Wire Assembly (L.H.)	.50
S-13850		Spring & Insulator Strip Assembly	.06
S-14755		Handle Strip Assembly	.05
S-15485		Shield & Battery Retaining Spring Assembly	.55
S-16125		Bottom Cover & Latch Assembly	.70
		BATTERIES	
Z-67		"B" Battery	
Z-2NL		"A" Battery (or Z-4NL or two Z-3NL)	
		CABINET PARTS for MODEL G402G (Chassis 4G41) ONLY	
14-1252		Plastic Cabt. for G402G Portable Model	2.25
16-561		Packing Carton	
24-551		Wavemagnet Cover	.50
24-552		Cabinet Cover	1.10
43-192		Handle End Pieces (2 used)	1.25
46-868		Front Cover Latch Knob	.40
46-869		Tuning Control Knob	.06
46-870		"On-Off" Switch Knob	.06
46-871		Volume Control Knob	.10
57-1659		Cabinet Front Plate	3.50
83-1793		Decorative Strip	.60
199-139		Flexible Handle Sleeve	.30

es shown are suggested list prices and are subject to change without notice.

MODEL G500
CHASSIS

PARTS LIST

		...M)
		...nob (31M)
		...itch Knob (49M)
		...and Switch Knob (BC)
		Tuning & Volume Control Knob (2 used)
		Front Panel Escutcheon
		Dial Pointer
59-195		"On-Off" Indicator
61-141		Pointer Pulley
73-113		#8-32 x 1/4 Slab. Head Set Screw (Used on S-11207)
76-415		Tuning Control Shaft
76-555		Pointer Drive Shaft
80-69		Dial Cord Tension Spring (2 used)
80-553		Indicator Tension Spring
83-1661		Rubber Strip (Used on 26-398)
93-470		1/64 x .136 x 5/16" Black Fibre Washer (Used on 59-195)
93-556		1/32 x .144 x 3/8 Washer Steel (2 used on 26-398)
188-32		Retaining Ring
S-11207		Indicator Lever & Bushing Assembly
S-15781		Drive Pulley Cord & Eyelet Assembly (short)
S-15782		Pointer Pulley Cord & Eyelet Assembly (long)
S-15784		Pointer Pulley & Shaft Assembly

COILS & CHOKES

95-1148	T1	1st. I.F. Transformer
95-1149	T2	2nd. I.F. Transformer
S-11952	L25	R. F. Shunt Coil Assembly
S-14403	L4	R. F. Choke Coil Assembly
S-15886	L3	Oscillator Coil
S-15887	L2	Detector Coil Assembly

CONDENSERS

22-3	C-7	.01 Mfd. Ceramic	500V
22-4	C16	.004 Mfd. Ceramic (or 22-1782)	500V
22-1390	C5	470 Mmfd. Mica	500V
22-1674	C23	50 Mmfd. Ceramic	500V
22-1739	C14	150 Mmfd. Ceramic	500V
22-1740	C13	150 Mmfd. Ceramic	500V
22-1741	C25, 26, 27 & 28	Elect. Cond. 60 Mfd. 150V x 40 Mfd. 150V 20 Mfd. 150V x 200 Mfd. 10V	
22-1746	C12	75 Mmfd. Ceramic	500V
22-1775	C15	.047 Mfd.	400V
22-1777	C11	.1 Mfd.	200V
22-1779	C24	.01 Mfd.	600V
22-1783	C20	.0047 Mfd.	400V
22-1784	C9	.01 Mfd.	200V
22-1839	C8	.001 Mfd.	200V
22-1844	C31	.047 Mfd.	600V
22-1846	C17	.01 Mfd.	400V
22-1886	C10	.001 Mfd. Ceramic	500V
22-2056	C21	Elect. Cap. 12 Mfd.	150V
22-2058	C6	270 Mmfd. Mica	500V
22-2064	C1	Three Section Variable Cond. (Includes Drive Pulley)	
22-2071	C19	.022 Mfd.	200V
22-2072	C22	.022 Mfd.	400V

PART NO.	REF.NO.	DESCRIPTION

RESISTORS

63-1362	R22, 23	Two Section Candohm
63-1744	R24	100 Ohm 1/2W 20% Ins. Res.
63-1754	R3	180 Ohm 1/2W 10% Ins. Res.
63-1761	R20	270 Ohm 1/2W 10% Ins. Res.
63-1764	R5	330 Ohm 1/2W 10% Ins. Res.
63-1775	R15	560 Ohm 1/2W 10% Ins. Res.
63-1785	R12	1000 Ohm 1/2W 10% Ins. Res.
63-1792	R16	1500 Ohm 1/2W 10% Ins. Res.
63-1800	R2	2200 Ohm 1/2W 20% Ins. Res.
63-1807	R7	3300 Ohm 1/2W 20% Ins. Res.
63-1835	R4	15K Ohm 1/2W 20% Ins. Res.
63-1838	R17	18K Ohm 1/2W 10% Ins. Res.
63-1845	R18	27K Ohm 1/2W 10% Ins. Res.
63-1863	R6	68K Ohm 1/2W 20% Ins. Res.
63-1869	R28	100K Ohm 1/2W 10% Ins. Res.
63-1880	R8	180K Ohm 1/2W 10% Ins. Res.
63-1891	R13	330K Ohm 1/2W 20% Ins. Res.
63-1912	R1	1 Megohm 1/2W 20% Ins. Res.
63-1940	R10	4.7 Megohm 1/2W 20% Ins. Res.
63-1943	R9	5.6 Megohm 1/2W 10% Ins. Res.
63-1954	R19	10 Megohm 1/2W 20% Ins. Res.
63-1961	R11	15 Megohm 1/2W 20% Ins. Res.
63-2018	R21	130 Ohm (Zipohm) 3W 10% Ins. Res.
63-2037	R14	Volume Control & Switch

MISCELLANEOUS

11-104		Line Cord & Plug
15-57		Cap. & Insulator (Batt. Cable)
44-17		Headphone Jack
49-668	SP-1	5 1/4" P. M. Speaker 208-668 Cone & Voice Coil 206-668 Output Trans.
54-34		#6-32 x 1/4" Hex. Nut Steel (2 ea. used on I.F.'s 1 used on 212-5)
78-274		Electrolytic Cond. Socket
78-543		Four Contact Socket (Batt. Cable)
78-802		Wavemagnet Socket
78-806		Miniature Tube Socket
78-817		Miniature Tube Socket
78-844		Adaptor Socket (220V)
78-845		Miniature Tube Socket (3 used)
83-1071		Threaded Core Retaining Strip (15 used)
83-1633		Ant., Gnd., Terminal Strip
83-1646		Speaker Gasket Support Strip
85-450	S3	Power Change-Over Switch
85-460	S2	Tone Control Switch
94-295		Gang Cond. & Speaker Mtg. Bushing (6 used)
149-86		Iron Core (15 used)
196-125		Speaker Gasket
212-5	SE-1	Selenium Rectifier

BATTERIES

Z985		A-B Battery Pack

CABINET PARTS

S-15635		Wavemagnet Suction Cup Assembly (2 used)
S-15797		Front Cover Hinge & Terminal Assembly (Right)
S-15798		Front Cover Hinge & Terminal Assembly (Left)
S-15799		Wavemagnet Cable Assembly
S-15802		Telescoping Ant. Assembly
S-15805		Wavemagnet Extension Cable Assembly
S-16027		Wavemagnet Assembly
S-16035		Grille Cloth & Baffle Assembly

PART NO.	REF.NO.	DESCRIPTION

CABINET PARTS

12-1082		Telescoping Ant. Mtg. Brkt.
14-1203		Model G500 Portable Cab.
17-67		Telescoping Ant. Rod Retaining Clamp
19-134		Wavemagnet Cable Retaining Clip
36-42		Cab. Handle
46-806		Ant. Knob (part of S-15802)
54-211		Speed Nut (6 used)
54-295		Wavemagnet Retaining Nut (#6-32)
54-296		Wavemagnet Retaining Nut (#10-32)
57-1052		Cab. Front Panel
57-1495		Emblem Plate
70-6		#8 x 1 1/4 R.H. Wood Screw
70-131		#4 x 1/2 Phillips B.H. Wood Screw (4 used)
83-1122		Push Button Felt Strip
93-684		1/16 x 5/32 x 5/8 Black Felt Washer (2 used)
93-721		1/16 x 25/64 x 5/16 Black Felt Washer (2 used)
97-367		Handle Mouting Stud (2 used)
114-197		#10 x 3/4" Hex. Slotted Washer Hd. S.T. Screw (2 used)
156-22		Door Latch (Upper Half)
156-23		Door Latch (Lower Half)
157-7		Strike Fastener (2 used)
157-8		Strike Fastener (2 used)
159-48		Snap Button (2 used)
159-49		Snap Button (6 used)
192-129		Dial Crystal
199-119		Ant. Insulating Sleeve
202-734		Instruction Book & Station Log

FREQUENCY BAND SWITCH ASSEMBLY

S-15786		Band Sw. Brkt., & Coil Assem. (Complete)
S-15871	L23	R. F. Coil Assembly (16M)
S-15872	L22	R. F. Coil Assembly (19M)
S-15873	L21	R. F. Coil Assembly (25M)
S-15874	L20	R. F. Coil Assembly (31M)
S-15875	L19	R. F. Coil Assembly (49M)
S-15876	L13	Antenna Coil Assembly (16M)
S-15877	L12	Antenna Coil Assembly (19M)
S-15878	L11	Antenna Coil Assembly (25M)
S-15879	L10	Antenna Coil Assembly (31M)
S-15880	L9	Antenna Coil Assembly (49M)
S-15881	L18	Oscillator Coil Assembly (16M)
S-15882	L17	Oscillator Coil Assembly (19M)
S-15883	L16	Oscillator Coil Assembly (25M)
S-15884	L15	Oscillator Coil Assembly (31M)
S-15885	L14	Oscillator Coil Assembly (49M)
S-16047	L24	Antenna Loading Coil Assembly
12-1614		Band Switch Mounting Bracket
22-3		.01 Mfd. Ceramic 500V
22-1390		470 Mmfd. Mica. 500V
22-1392		25 Mmfd. Ceramic 500V
22-1740		150 Mmfd. Ceramic 500V
22-1839		.001 Mfd. 200V
22-1953		10 Mmfd. Ceramic 500V
63-1842		22K Ohm 1/2W 20% Ins. Res.
85-459	S1	Band Switch

VOLTAGE ADAPTOR

S-15715		Voltage Adaptor Assembly (Complete)
57-1564		Voltage Indicator Plate
58-182		Two Prong Plug
63-2020		620 Ohm W.W. 10% 15W
63-2021		1200 Ohm W.W. 10% 7W
85-473	S4	Three Position Sw.
112-784		Thumb Screw
212-9	SE-2	Selenium Rectifier

PART NO.	DIAG. NO.	DESCRIPTION	PRICE
		MISCELLANEOUS Cont'd	
54-254		Speed Nut - Tinnerman (3 used on 83-1416)	.85C
57-1314		Cabinet Front Plate	3.00
57-1315		Chassis Bottom Plate	.50
78-274		Elect. Cond. Socket	.03
78-781		Miniature Tube Socket	.20
78-782		Miniature Tube Socket	.25
80-564		"B" Battery Retaining Spring	.06
80-567		Latch Spring	.02
80-611		Latch Spring	.03
80-612		"A" Battery Front Contact Spring	.03
83-1416		Decorative Strip	.60
83-1417		Rubber Strip - Handle	.10
83-1428		Wavemagnet Retaining Strip	.03
83-1513		"B" Battery Terminal Strip	.25
85-433	S2	On-Off Switch	1.20
85-454	S1	Power Change-Over Switch	2.00
93-870		Fibre Shoulder Washer	.02
93-935		.015 x 7/16" x 3/4" Armite Washer	.01
94-295		Gang Cond. Mtg. Bushing (3 used)	.04
95-1014	T3	Output Transformer	1.65
110-127		Grill Cloth	.15
112-56		#6 x 1/4" Hex Hd. S.T. Screw Cad. (3 used S-15482, 2 used 126-539)	.55C
112-322		#2 x 3/16" Phill. Oval Hd. S.T. Screw (4 used on Wavemagnet & Cover)	.03
112-407		#6 x 3/8" Rd. Hd. S.T. Screw Cad. Pl. (2 used to mount ea. 43-149)	.02
112-685		#4 x 3/16" Flt. Hd. S.T. Screw Cad. (4 used on Wavemagnet & Cover)	.02
112-711		#4 x 1/4" B.H. S.T. Screw Stat. Br. (8 used)	1.20C
113-17		#6-32 x 1/4" R.H. M.S. Steel N.P. (2 used Chassis Mtg.)	.02
114-58		#6-32 x 3/8" Hex Hd. MS Steel (3 used 22-1457)	.43C
125-17		Rubber Grommet (3 used 22-1457)	.03
125-58		Strain Relief Grommet	.15
125-59		Strain Relief Grommet	.15
126-539		Volume Control & Power Switch Shield	.15
199-79		Flexible Handle Sleeve	.30
199-79Y		Flexible Handle Sleeve (Y & W Model only)	.30
202-757		Instruction Book	.20
212-5	SE1	Selenium Rectifier	1.80
S-13777		Power Switch Shield Assembly	.20
S-13786	L1	Wavemagnet Winding Assembly	.75
S-13848		Hinge & Wire Assembly (R.H.)	.50
S-13849		Hinge & Wire Assembly (L.H.)	.50
S-13850		Spring & Insulator Strip Assembly	.06
S-14755		Handle Strip Assembly	.05
S-15485		Shield & Battery Retaining Spring Assembly	.55
S-16125		Bottom Cover & Latch Assembly	.70
		BATTERIES	
Z-67		"B" Battery	
Z-2NL		"A" Battery (or Z-4NL or two Z-3NL)	
		CABINET PARTS for MODEL G402G (Chassis 4G41) ONLY	
14-1252		Plastic Cabt. for G402G Portable Model	2.25
16-561		Packing Carton	
24-551		Wavemagnet Cover	.50
24-552		Cabinet Cover	1.10
43-192		Handle End Pieces (2 used)	1.25
46-868		Front Cover Latch Knob	.40
46-869		Tuning Control Knob	.06
46-870		"On-Off" Switch Knob	.06
46-871		Volume Control Knob	.10
57-1659		Cabinet Front Plate	3.50
83-1793		Decorative Strip	.60
199-139		Flexible Handle Sleeve	.30

es shown are suggested list prices and are subject to change without notice.

MODEL C500
CHASSIS 5G40

LOOP — 2.8X AT 600 KC — G — 6.6X AT 600 KC — G — 35X FROM 600KC TO 455KC — G — 11X FROM 455 KC TO 400 ~ — G — 65X AT 400 ~ 50 M.W. OUTPUT — G — 14X AT 400 ~ 50 M.W. OUTPUT — P

1U4 R.F. | 1L6 CONVERTER | 1U4 I.F. | 1S5 DET. AMP. | 3V4 PWR. AMP.

L1 0.7Ω
P1
POLE ANT.
R1 1.0 MEG.
C6 270 MMF.
C1 C2
R2 2200
C5 470 MMF.
C7 .01
C9 .01
R3 180 ±10%
R4 15K
L2 6.1Ω 6.0Ω
C3
C10 .001
R6 68K ±10%
R5 330 ±10%
C11 0.1
R7 3300
R8 180K ±10%
C12 75 MMF.
L4 2.3Ω
L3 .11Ω .013Ω 3.42Ω 8.2Ω
C4
C13 150 MMF.
C14 150 MMF.
OSC. COIL
DET. COIL
C15 .047
C16 .004
C17 .01
R9 5.8 MEG.
R10 4.7 MEG.
R11 15 MEG.
R12 1000 ±10%
R13 330K
C18 .022
C20 .0047
C21 J 12 MFD.
R19 10 MEG.
R14 1 MEG. VOLUME CONTROL
T1 T2 L5 L6 L7 L8 2.5Ω
R15 560 ±10%
C22 .022
C23 50 MMF.
R10 4.7 MEG.
R1 1 MEG.
C24 .01
R20 270 ±10%
280Ω RED BL
SL GR 13Ω 3.0Ω YEL BR BLK
P3 PHONE SOCKET
SP-1
R18 1500 ±10%
C8 .001
R28 100K ±10%
C19 .022
R17 18K ±10%
R18 27K ±10%
TREBLE (OPEN) BASS (OPEN) VOICE (OPEN) ALTO (CLOSED)
S2 TONE CONTROL SWITCH
SWITCH ON VOL. CONTROL R14
R21 130 ±10%
R22 950 ±10%
R23 950 ±10%
50 V.
C25 60 MFD. C26 20 MFD. C27 40 MFD. C28 200 MFD.
SE-1
B-
P2 ADAPTER SOCKET
C31 .047
117 V.A.C. 10W.
117 V.D.C. 7.5W.
230 V.A.C. 20W.
230 V.D.C. 15W.
CHANGE-OVER SWITCH S3 SHOWN IN POSITION FOR A.C. OPERATION.
S3
W1 RED A+ BL B+ BLK A-
R24 100
SOCKET END VIEW OF CABLE

ANTENNA
OSCILLATOR
DETECTOR
L9 0.7Ω L10 0.5Ω L11 0.4Ω L12 0.3Ω L13 0.2Ω
C29 25 MMF.
C29 25 MMF.
L24 0.1Ω
C30 10 MMF.
C13 150 MMF.
L14 0.52Ω L15 0.28Ω L16 0.21Ω L17 0.07Ω L18 0.05Ω
C8 .001
L25 2Ω
R25 22K
L19 0.9Ω L20 0.8Ω L21 0.5Ω L22 0.4Ω L23 0.3Ω
C7 .01
FRONT VIEW OF SWITCH
S1
BAND SELECTOR SWITCH, COIL AND WIRE ASSEMBLY
BAND SWITCH BUTTONS SHOWN IN NON-OPERATED "OUT" POSITION

A1 220V. ADAPTER
P4
R27 1200
R26 620
S4
SE-2
SWITCH POSITIONS
110V. A.C. CONTACTS 1 & 2 SHORTED.
220V. D.C. CONTACTS 2 & 3 SHORTED.
220V. A.C. CONTACTS 3 & 4 SHORTED.

TUNING RANGES
535 — 1620 KC.
6.0 — 6.2 MC.
9.45 — 9.75 MC.
11.5 — 12.1 MC.
14.9 — 15.5 MC.
17.5 — 18.1 MC.

I.F. FREQUENCY 455 KC.

BATTERY PACK NO. Z-985

USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT.
IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.
I.F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL AS FIRST TERMINAL CLOCKWISE AND ADJACENT TO MARKER, AS VIEWED FROM BOTTOM OF CHASSIS.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER, AND SET OPERATING ON 117 V. A.C.
ALL RESISTORS ±20% TOLERANCE, UNLESS OTHERWISE SPECIFIED.
ALL TONE BUTTONS SHOWN IN "RIGHT" POSITION AS VIEWED FROM FRONT OF CABINET.

DENOTES CHASSIS DENOTES B-

POSITION OF TERMINALS SWITCH S3

L2 DET. COIL

L3 OSC. COIL
WHITE DOT

TO THE SERVICE MAN:

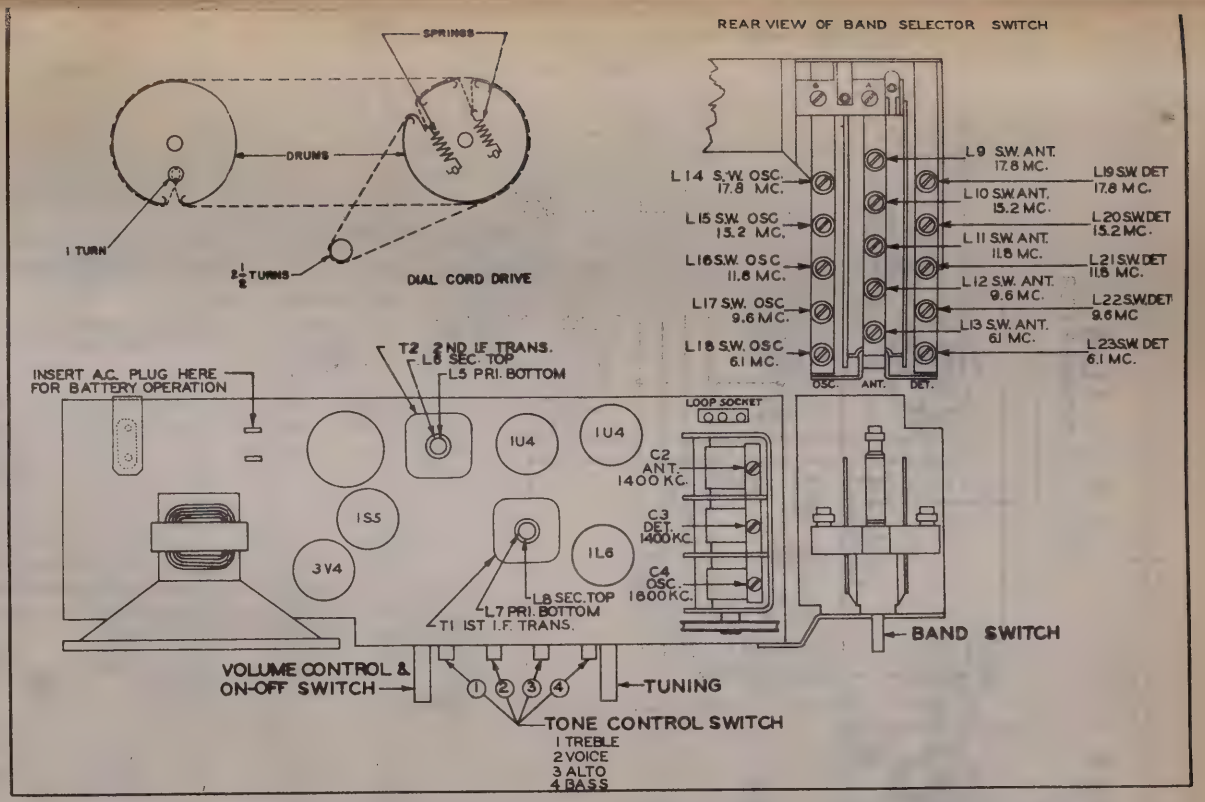
Chassis 5G40 features a high gain tuned RF stage ahead of a conventional superheterodyne circuit with band spread tuning on the 49, 31, 25, 19 and 16 meter bands.

If removal of the chassis from the cabinet ever becomes necessary this should be done with care.

The alignment of chassis 5G40 is conventional. However, care must be exercised when making adjustments, and the alignment procedure must be followed exactly. Set the chassis over a metal plate approximately the same distance the battery pack is from the bottom of the chassis when it is in the cabinet. This procedure will introduce the approximate amount of metal in the field of the RF and oscillator coils as when the chassis is in the cabinet. A signal generator of reasonable accuracy and good attenuation must be used. An output meter (AC) of the copper oxide rectifier type with a range of 1 to 30 volts in several steps is necessary to get accurate output readings. Alignment wrenches should be of the non-metallic type, especially when making adjustments at the higher frequencies.

When reinstalling the chassis in the cabinet be careful not to disturb the cabling between the short wave coil assembly and chassis. Tune in a weak broadcast signal near 1400 Kc. and touch up trimmer C2. This will insure maximum performance after alignment.

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Positive lead of signal generator to converter grid through a .1 MFD condenser and negative lead to negative filament of 1L6 tube.		455 Kc.	BC	600 Kc.	L5, 6, 7, 8	Align I.F.
2			1600 Kc.	BC	1600 Kc.	C4	Set Oscillator to Scale
3	One turn loop Coupled loosely to Broadcast Wavemagnet		1400 Kc.	BC	1400 Kc.	C3	Alignment of Detector
4			1400 Kc.	BC	1400 Kc.	C2	Alignment of B.C. Wavemagnet
5*	3 feet of wire Approx. 1 foot from Extended Waverod		6.1 Mc.	49 Met.	6.1 Mc.	L18, 23, 13	Alignment of S.W. Oscillator, detector and antenna
6*			9.6 Mc.	31 Met.	9.6 Mc.	L17, 22, 12	
7*			11.8 Mc.	25 Met.	11.8 Mc.	L16, 21, 11	
8*			15.2 Mc.	19 Met.	15.2 Mc.	L15, 20, 10	
9*			17.8 Mc.	16 Met.	17.8 Mc.	L14, 19, 9	

*NOTE: Rock Tuning Condenser When Making Alignment Under Operations 5,6,7, 8 and 9.

PARTS LIST—Continued

Part No.	Ref. No.	Description	Suggested List Price
		MISCELLANEOUS (Continued)	
54-267		#6-32 x 5/16" Palnut Cad. Pl. (1 ea. used on 95-1132 & 95-1133)	.45C
54-282		Spring Nut Cad. Pl. (1 each used on 26-420 & S-16711)	.01
54-283		Spring Nut Black Oxide (used on S-16711)	.01
54-284		Wavemagnet Lead Retaining Nut (2 used)	.02
54-307		Spring Nut (7 used on Esc. Mtg.)	.01
57-1480		Chassis Bottom Cover Plate	.50
57-1491		Latch Plate	.01
61-71		Idler Pulley (4 used)	.02
61-133		Pointer Pulley	.15
61-136		Idler Pulley	.07
64-290		Shoulder Rivet (used on 61-71)	.02
64-303		Shoulder Rivet (used on S-15433)	.02
70-158		#2 x 3/8" Phill. Oval Hd. W.S. Steel Black Oxide (3 used on Esc. Mtg.)	
70-159		#5 x 7/16 Phill. R.H. W.S. Steel N.P. (2 used on each 12-1433)	
78-274		Elect. Cond. Socket	.03
78-543		Battery Cable Socket (4 contact)	.13
78-782		Miniature Tube Socket	.25
78-806		Miniature Tube Socket	.15
78-807		Miniature Tube Socket	.15
80-742		Door Catch Spring	.10
80-799		Latch Spring	.03
85-450	S1	Power Change Over Switch	1.00
85-451	S2	On-Off Switch	.55
93-869		#6 Split Lockwasher (used on 212-10)	.01
93-1003		Brass Spacer Washer (used on S-16711 & S-15977)	.02
93-1004		Fibre Spacer Washer (2 used on ea. S-16711 & S-15977)	.01
94-295		Gang Cond. Mtg. Bushing (3 used)	.04
97-367		Handle Mtg. Stud	.25
112-800		#2 x 1/4" Phill. R.H.S.T. Screw Brass Plate (2 used on 57-1632)	.01
113-18		#6-32 x 5/16" Hex. Hd. Sl. M.S. Cad. Pl. (2 used on 85-450)	.02
114-26		#8 x 1/4" Hex. Hd. S.T. Screw Cad. Pl. (4 used on 57-1480)	.55C
114-295		#8 x 5/16" Hex. Hd. Sl. S.T. Screw Shakeproof Cad. Pl. (4 used chassis mtg.)	.75C
114-311		#6-32 x 1" Hex. Hd. Sl. M.S. Steel (used on 212-10)	.02
138-36		Cabinet Grille	.90
147-166		Speaker Mtg. Spacer (2 used)	
156-41		Door Latch	.08
166-44		Rubber Bumper (Speaker & Gang)	.02
192-132		Dial Glass	.70
202-804		Instruction Book	.15
212-10	SE-1	Selenium Rectifier	1.80
S-15433		Support Brkt. & Idler Pulley Assy.	.45
S-15434		Wavemagnet Assembly	.70
S-15438		Battery Cable & Socket Assy.	.50
S-15977		Wavemagnet, Pulley & Sleeve Assy. (Y model only)	1.75
S-16710		Speaker Baffle & Grill Cloth Assy.	.25
S-16711		Wavemagnet Pulley & Sleeve Assy.	1.75
Z909		Battery	

Prices are subject to change without notice.

TO THE SERVICE MAN:

The 5G41 chassis is an AC, DC or battery operated superheterodyne. The chassis is isolated from the DC circuit, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the negative side or container of the electrolytic. When the change-over Switch S1 is in AC position, the DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will result. Microphonic tubes will cause audio howl. Check the 1L6 and 1S5

TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

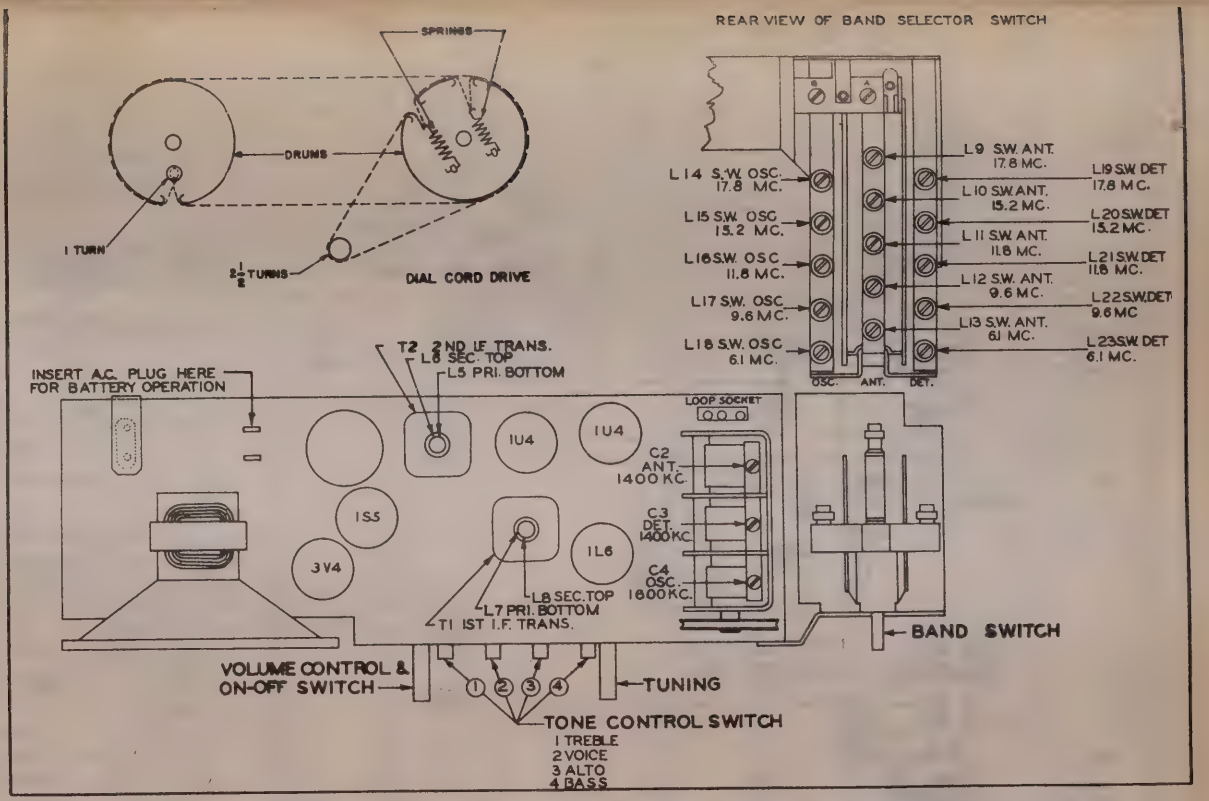
Chassis 5G40 features a high gain tuned RF stage ahead of a conventional superheterodyne circuit with band spread tuning on the 49, 31, 25, 19 and 16 meter bands.

If removal of the chassis from the cabinet ever becomes necessary this should be done with care.

The alignment of chassis 5G40 is conventional. However, care must be exercised when making adjustments, and the alignment procedure must be followed exactly. Set the chassis over a metal plate approximately the same distance the battery pack is from the bottom of the chassis when it is in the cabinet. This procedure will introduce the approximate amount of metal in the field of the RF and oscillator coils as when the chassis is in the cabinet. A signal generator of reasonable accuracy and good attenuation must be used. An output meter (AC) of the copper oxide rectifier type with a range of 1 to 30 volts in several steps is necessary to get accurate output readings. Alignment wrenches should be of the non-metallic type, especially when making adjustments at the higher frequencies.

When reinstalling the chassis in the cabinet be careful not to disturb the cabling between the short wave coil assembly and chassis. Tune in a weak broadcast signal near 1400 Kc. and touch up trimmer C2. This will insure maximum performance after alignment.

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.



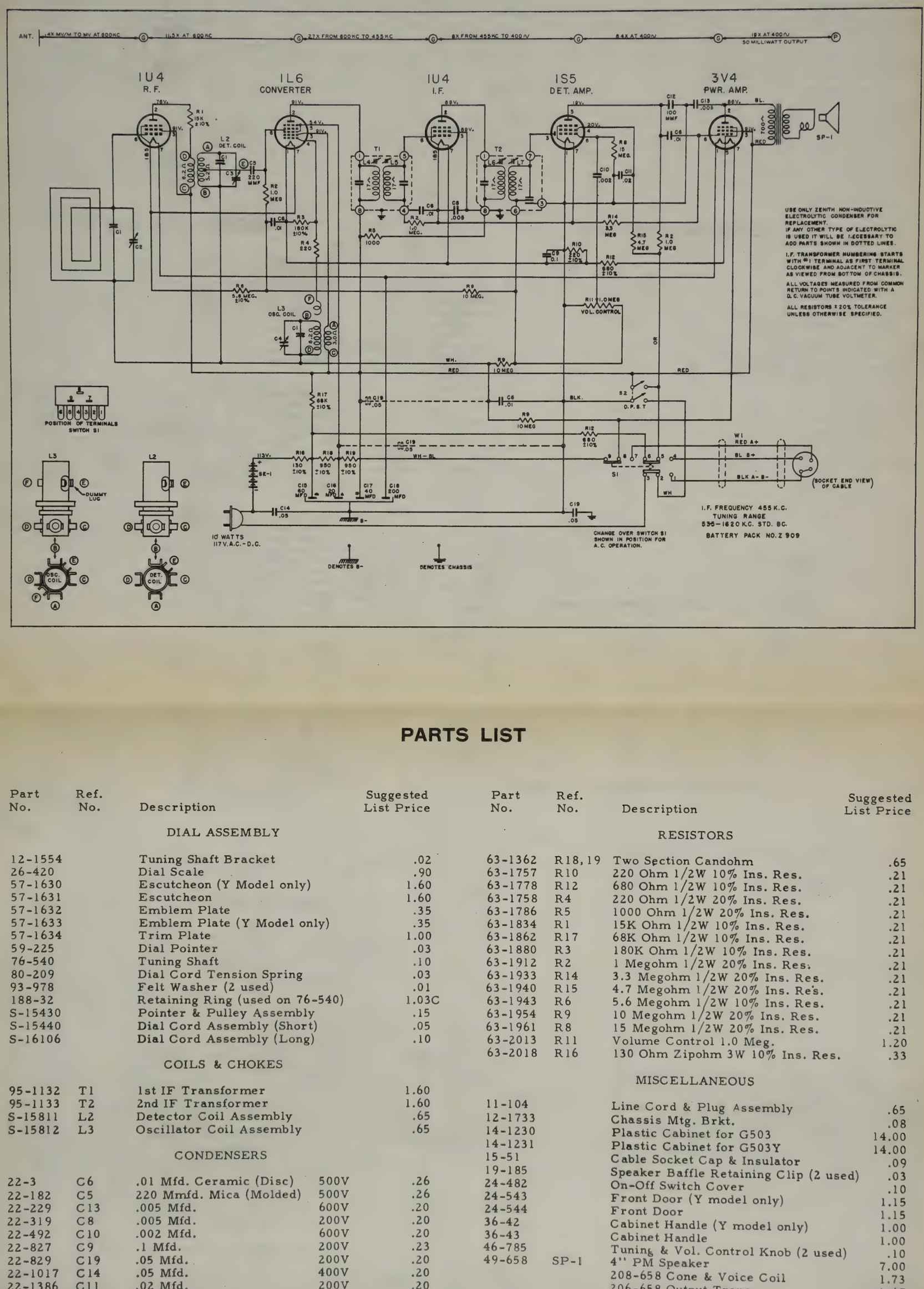
TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Positive lead of signal generator to converter grid through a .1 MFD condenser and negative lead to negative filament of 1L6 tube.		455 Kc.	BC	600 Kc.	L5, 6, 7, 8	Align I.F.
2			1600 Kc.	BC	1600 Kc.	C4	Set Oscillator to Scale
3	One turn loop Coupled loosely to Broadcast Wavemagnet		1400 Kc.	BC	1400 Kc.	C3	Alignment of Detector
4			1400 Kc.	BC	1400 Kc.	C2	Alignment of B.C. Wavemagnet
5*	3 feet of wire Approx. 1 foot from Extended Waverod		6.1 Mc.	49 Met.	6.1 Mc.	L18, 23, 13	Alignment of S.W. Oscillator, detector and antenna
6*			9.6 Mc.	31 Met.	9.6 Mc.	L17, 22, 12	
7*			11.8 Mc.	25 Met.	11.8 Mc.	L16, 21, 11	
8*			15.2 Mc.	19 Met.	15.2 Mc.	L15, 20, 10	
9*			17.8 Mc.	16 Met.	17.8 Mc.	L14, 19, 9	

*NOTE: Rock Tuning Condenser When Making Alignment Under Operations 5, 6, 7, 8 and 9.

MODEL G503—CHASSIS 5G41



PARTS LIST

Part No.	Ref. No.	Description		Suggested List Price
		DIAL ASSEMBLY		
12-1554		Tuning Shaft Bracket		.02
26-420		Dial Scale		.90
57-1630		Escutcheon (Y Model only)		1.60
57-1631		Escutcheon		1.60
57-1632		Emblem Plate		.35
57-1633		Emblem Plate (Y Model only)		.35
57-1634		Trim Plate		1.00
59-225		Dial Pointer		.03
76-540		Tuning Shaft		.10
80-209		Dial Cord Tension Spring		.03
93-978		Felt Washer (2 used)		.01
188-32		Retaining Ring (used on 76-540)		1.03C
S-15430		Pointer & Pulley Assembly		.15
S-15440		Dial Cord Assembly (Short)		.05
S-16106		Dial Cord Assembly (Long)		.10
		COILS & CHOKES		
95-1132	T1	1st IF Transformer		1.60
95-1133	T2	2nd IF Transformer		1.60
S-15811	L2	Detector Coil Assembly		.65
S-15812	L3	Oscillator Coil Assembly		.65
		CONDENSERS		
22-3	C6	.01 Mfd. Ceramic (Disc)	500V	.26
22-182	C5	220 Mmfd. Mica (Molded)	500V	.26
22-229	C13	.005 Mfd.	600V	.20
22-319	C8	.005 Mfd.	200V	.20
22-492	C10	.002 Mfd.	600V	.20
22-827	C9	.1 Mfd.	200V	.23
22-829	C19	.05 Mfd.	200V	.20
22-1017	C14	.05 Mfd.	400V	.20
22-1386	C11	.02 Mfd.	200V	.20
22-1669	C12	100 Mmfd. Ceramic	500V	.20
22-1741	C15, 16, 17, 18	Four Section Elect. Cond.		3.50
22-2070	C1	Three Section Gang Cond.		3.60

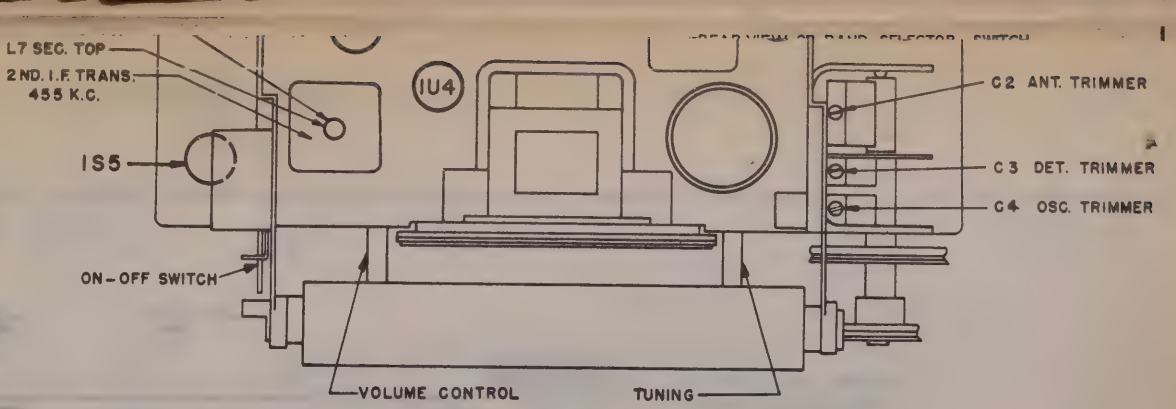
Part No.	Ref. No.	Description	Suggested List Price
		RESISTORS	
63-1362	R18, 19	Two Section Candohm	.65
63-1757	R10	220 Ohm 1/2W 10% Ins. Res.	.21
63-1778	R12	680 Ohm 1/2W 10% Ins. Res.	.21
63-1758	R4	220 Ohm 1/2W 20% Ins. Res.	.21
63-1786	R5	1000 Ohm 1/2W 20% Ins. Res.	.21
63-1834	R1	15K Ohm 1/2W 10% Ins. Res.	.21
63-1862	R17	68K Ohm 1/2W 10% Ins. Res.	.21
63-1880	R3	180K Ohm 1/2W 10% Ins. Res.	.21
63-1912	R2	1 Megohm 1/2W 20% Ins. Res.	.21
63-1933	R14	3.3 Megohm 1/2W 20% Ins. Res.	.21
63-1940	R15	4.7 Megohm 1/2W 20% Ins. Res.	.21
63-1943	R6	5.6 Megohm 1/2W 10% Ins. Res.	.21
63-1954	R9	10 Megohm 1/2W 20% Ins. Res.	.21
63-1961	R8	15 Megohm 1/2W 20% Ins. Res.	.21
63-2013	R11	Volume Control 1.0 Meg.	1.20
63-2018	R16	130 Ohm Zipohm 3W 10% Ins. Res.	.33
		MISCELLANEOUS	
11-104		Line Cord & Plug Assembly	.65
12-1733		Chassis Mtg. Brkt.	.08
14-1230		Plastic Cabinet for G503	14.00
14-1231		Plastic Cabinet for G503Y	14.00
15-51		Cable Socket Cap & Insulator	.09
19-185		Speaker Baffle Retaining Clip (2 used)	.03
24-482		On-Off Switch Cover	.10
24-543		Front Door (Y model only)	1.15
24-544		Front Door	1.15
36-42		Cabinet Handle (Y model only)	1.00
36-43		Cabinet Handle	1.00
46-785		Tuning & Vol. Control Knob (2 used)	.10
49-658	SP-1	4" PM Speaker	7.00
		208-658 Cone & Voice Coil	1.73
		206-658 Output Trans.	1.67
54-34		#6-32 x 1/4" x 3/32 Hex. Nut Steel NP (Used on 212-10)	.31C
54-139		#3/8-32 x 9/16" Palnut Type 9N Cad. Pl. (used on 63-2013)	.01

The wavemagnet is connected to the chassis by two wires that pass through the hollow dial pivots. If the R.F. becomes weak or dead, check the D.C. resistance of the wavemagnet. This D.C. resistance should be approximately .9 ohm. If it is open check the wavemagnet.

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the wavemagnet can be connected. All the connections and adjustments can be made from the top of the chassis. Connect a signal generator, through a .1 mfd. dummy antenna, to the converter grid and B- (common return). Connect an output meter across the voice coil of the speaker (two lugs provided). Set the signal generator to 455 Kc. and adjust L4, L5, L6 and L7 for the maximum indication on the output meter. Always keep the signal output from the generator just high enough to get an indication, otherwise excessive loading may result.

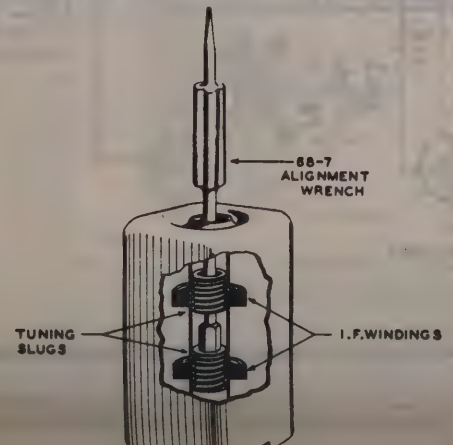
RF Alignment: Connect a two turn loop across the leads of the signal generator, loosely couple this loop to the wavemagnet. Set the signal generator and the dial pointer of the receiver to 1600 Kc. and adjust C4 oscillator trimmer to resonance. Set the signal generator and dial pointer to 1400 and adjust C2 and C3 antenna detector trimmers to resonance. These trimmers are on the top of gang condenser. Check operation and re-install set in cabinet. Tune in a weak station near 1400 Kc. or use background noise and readjust antenna trimmer for maximum sensitivity.

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

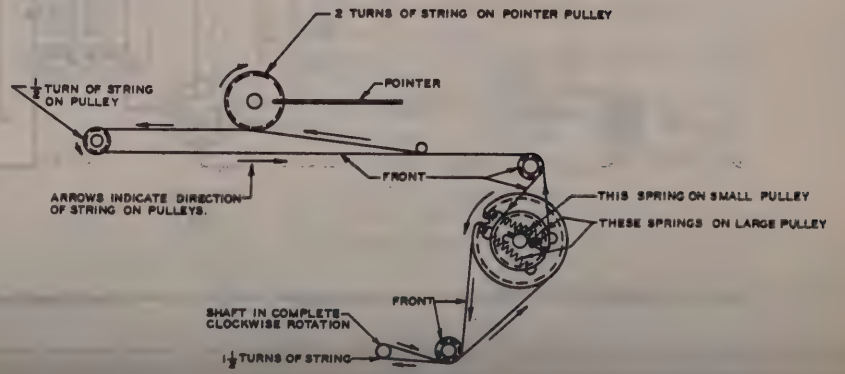


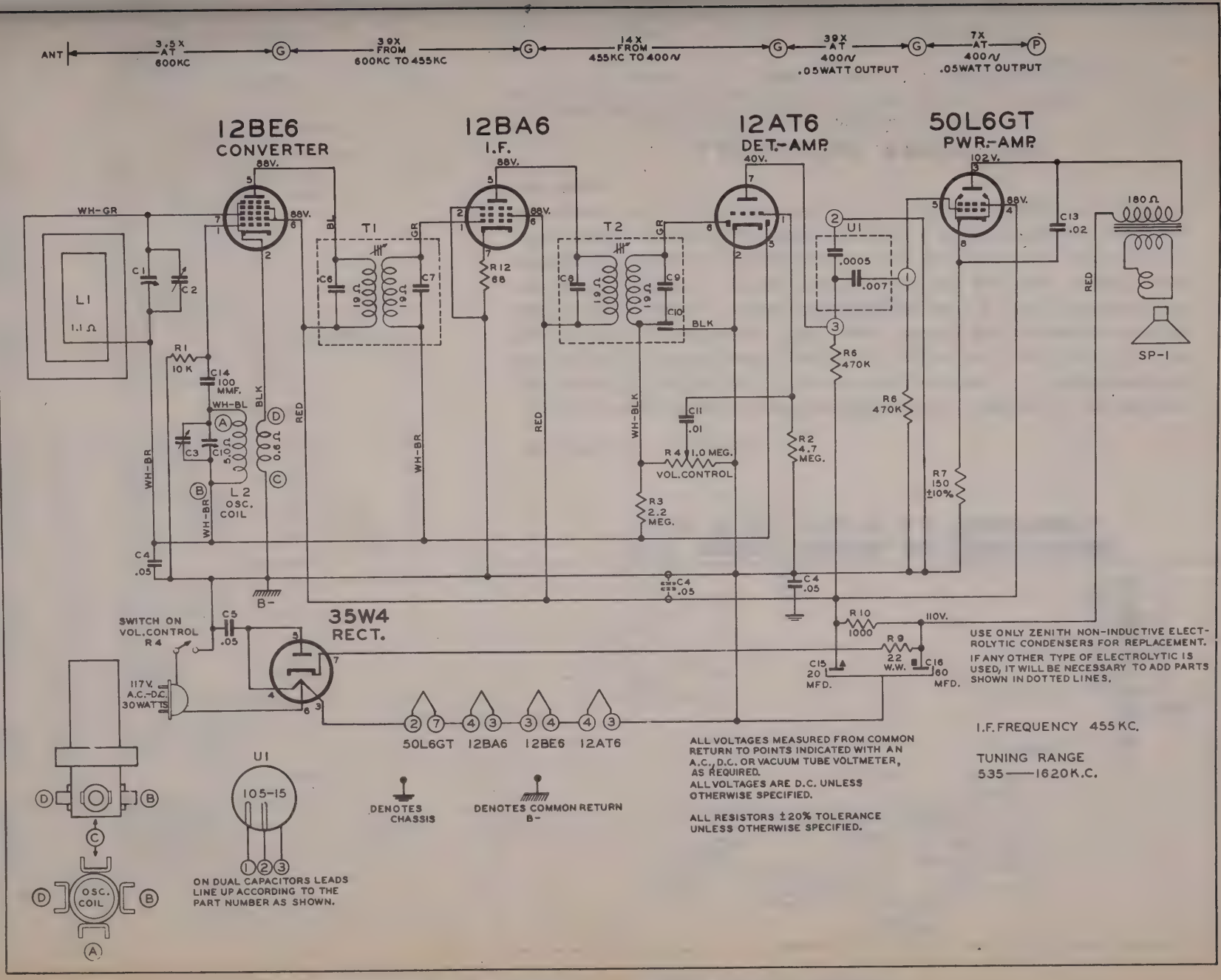
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL TO	TRIMMERS	PURPOSE
1	Converter Grid	.1 Mfd	455 Kc.	BC	600 Kc.	L4, 5, 6 & 7	I.F. Alignment
2	Two turns loosely coupled to Wavemagnet		1600 Kc.	BC	1600 Kc.	Osc. Trim. C4	Set Oscillator to scale
3	Two turns loosely coupled to Wavemagnet		1400 Kc.	BC	1400 Kc.	Ant. & Det. Trims C2 & C3	Align Wavemagnet

DETAILED VIEW OF I. F. TRANSFORMERS.



DIAL CABLE DRAWING


2 TURNS OF STRING ON POINTER PULLEY
½ TURN OF STRING ON PULLEY
POINTER
FRONT
ARROWS INDICATE DIRECTION OF STRING ON PULLEYS.
THIS SPRING ON SMALL PULLEY
THESE SPRINGS ON LARGE PULLEY
FRONT
SHAFT IN COMPLETE CLOCKWISE ROTATION
1½ TURNS OF STRING



MODEL G510 CHASSIS 5G02

PARTS LIST—Continued

Part No.	Ref. No.	Description	Suggested List Price
		MISCELLANEOUS (Continued)	
54-267		#6-32 x 5/16" Palnut Cad. Pl. (1 ea. used on 95-1132 & 95-1133)	.45C
54-282		Spring Nut Cad. Pl. (1 each used on 26-420 & S-16711)	.01
54-283		Spring Nut Black Oxide (used on S-16711)	.01
54-284		Wavemagnet Lead Retaining Nut (2 used)	.02
54-307		Spring Nut (7 used on Esc. Mtg.)	.01
57-1480		Chassis Bottom Cover Plate	.50
57-1491		Latch Plate	.01
61-71		Idler Pulley (4 used)	.02
61-133		Pointer Pulley	.15
61-136		Idler Pulley	.07
64-290		Shoulder Rivet (used on 61-71)	.02
64-303		Shoulder Rivet (used on S-15433)	.02
70-158		#2 x 3/8" Phill. Oval Hd. W. S. Steel Black Oxide (3 used on Esc. Mtg.)	
70-159		#5 x 7/16 Phill. R. H. W. S. Steel N.P. (2 used on each 12-1433)	
78-274		Elect. Cond. Socket	.03
78-543		Battery Cable Socket (4 contact)	.13
78-782		Miniature Tube Socket	.25
78-806		Miniature Tube Socket	.15
78-807		Miniature Tube Socket	.15
80-742		Door Catch Spring	.10
80-799		Latch Spring	.03
85-450	S1	Power Change Over Switch	1.00
85-451	S2	On-Off Switch	.55
93-869		#6 Split Lockwasher (used on 212-10)	.01
93-1003		Brass Spacer Washer (used on S-16711 & S-15977)	.02
93-1004		Fibre Spacer Washer (2 used on ea. S-16711 & S-15977)	.01
94-295		Gang Cond. Mtg. Bushing (3 used)	.04
97-367		Handle Mtg. Stud	.25
112-800		#2 x 1/4" Phill. R.H.S.T. Screw Brass Plate (2 used on 57-1632)	.01
113-18		#6-32 x 5/16" Hex. Hd. Sl. M.S. Cad. Pl. (2 used on 85-450)	.02
114-26		#8 x 1/4" Hex. Hd. S.T. Screw Cad. Pl. (4 used on 57-1480)	.55C
114-295		#8 x 5/16" Hex. Hd. Sl. S.T. Screw Shakeproof Cad. Pl. (4 used chassis mtg.)	.75C
114-311		#6-32 x 1" Hex. Hd. Sl. M.S. Steel (used on 212-10)	.02
138-36		Cabinet Grille	.90
147-166		Speaker Mtg. Spacer (2 used)	
156-41		Door Latch	.08
166-44		Rubber Bumper (Speaker & Gang)	.02
192-132		Dial Glass	.70
202-804		Instruction Book	.15
212-10	SE-1	Selenium Rectifier	1.80
S-15433		Support Brkt. & Idler Pulley Assy.	.45
S-15434		Wavemagnet Assembly	.70
S-15438		Battery Cable & Socket Assy.	.50
S-15977		Wavemagnet, Pulley & Sleeve Assy. (Y model only)	1.75
S-16710		Speaker Baffle & Grill Cloth Assy.	.25
S-16711		Wavemagnet Pulley & Sleeve Assy.	1.75
Z909		Battery	

Prices are subject to change without notice.

TO THE SERVICE MAN:

The 5G41 chassis is an AC, DC or battery operated superheterodyne. The chassis is isolated from the DC circuit, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the negative side or container of the electrolytic. When the change-over Switch S1 is in AC position, the DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will result. Microphonic tubes will cause audio howl. Check the 1L6 and 1S5.

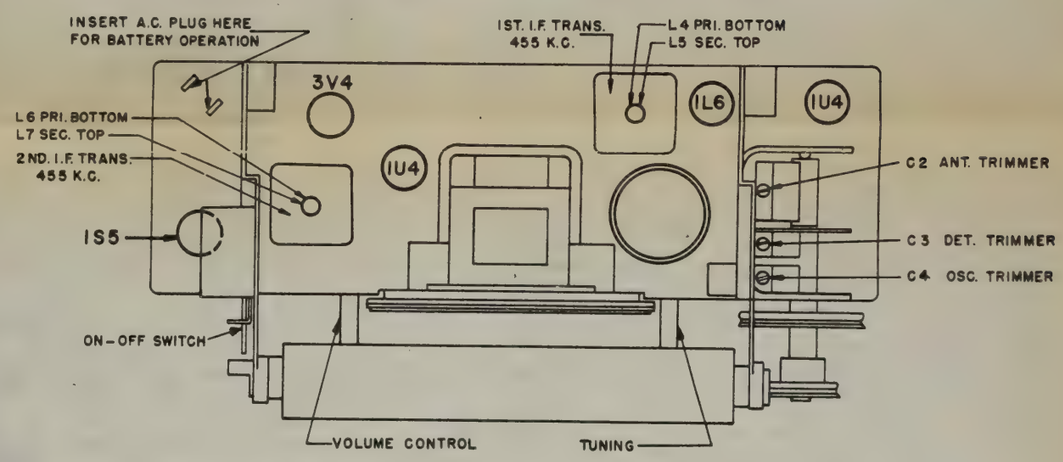
The wavemagnet is connected to the chassis by two wires that pass through the hollow dial pivots. If the R.F. becomes weak or dead, check the D.C. resistance of the wavemagnet. This D.C. resistance should be approximately .9 ohm. If it is open check the wavemagnet.

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the wavemagnet can be connected. All the connections and adjustments can be made from the top of the chassis. Connect a signal generator, through a .1 mfd. dummy antenna, to the converter grid and B- (common return). Connect an output meter across the voice coil of the speaker (two lugs provided). Set the signal generator to 455 Kc. and adjust L4, L5, L6 and L7 for the maximum indication on the output meter. Always keep the signal output from the generator just high enough to get an indication, otherwise excessive loading may result.

RF Alignment: Connect a two turn loop across the leads of the signal generator, loosely couple this loop to the wavemagnet. Set the signal generator and the dial pointer of the receiver to 1600 Kc. and adjust C4 oscillator trimmer to resonance. Set the signal generator and dial pointer to 1400 and adjust C2 and C3 antenna detector trimmers to resonance. These trimmers are on the top of gang condenser. Check operation and re-install set in cabinet. Tune in a weak station near 1400 Kc. or use background noise and readjust antenna trimmer for maximum sensitivity.

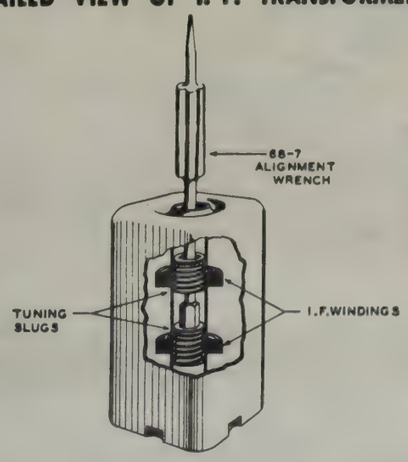
The I.E. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

TUBE AND TRIMMER LOCATION

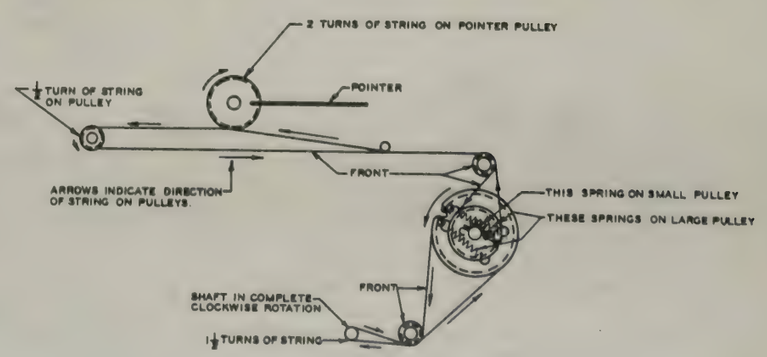


OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL TO	TRIMMERS	PURPOSE
1	Converter Grid	.1 Mfd	455 Kc.	BC	600 Kc.	L4, 5, 6 & 7	I.F. Alignment
2	Two turns loosely coupled to Wavemagnet		1600 Kc.	BC	1600 Kc.	Osc. Trim. C4	Set Oscillator to scale
3	Two turns loosely coupled to Wavemagnet		1400 Kc.	BC	1400 Kc.	Ant. & Det. Trims C2 & C3	Align Wavemagnet

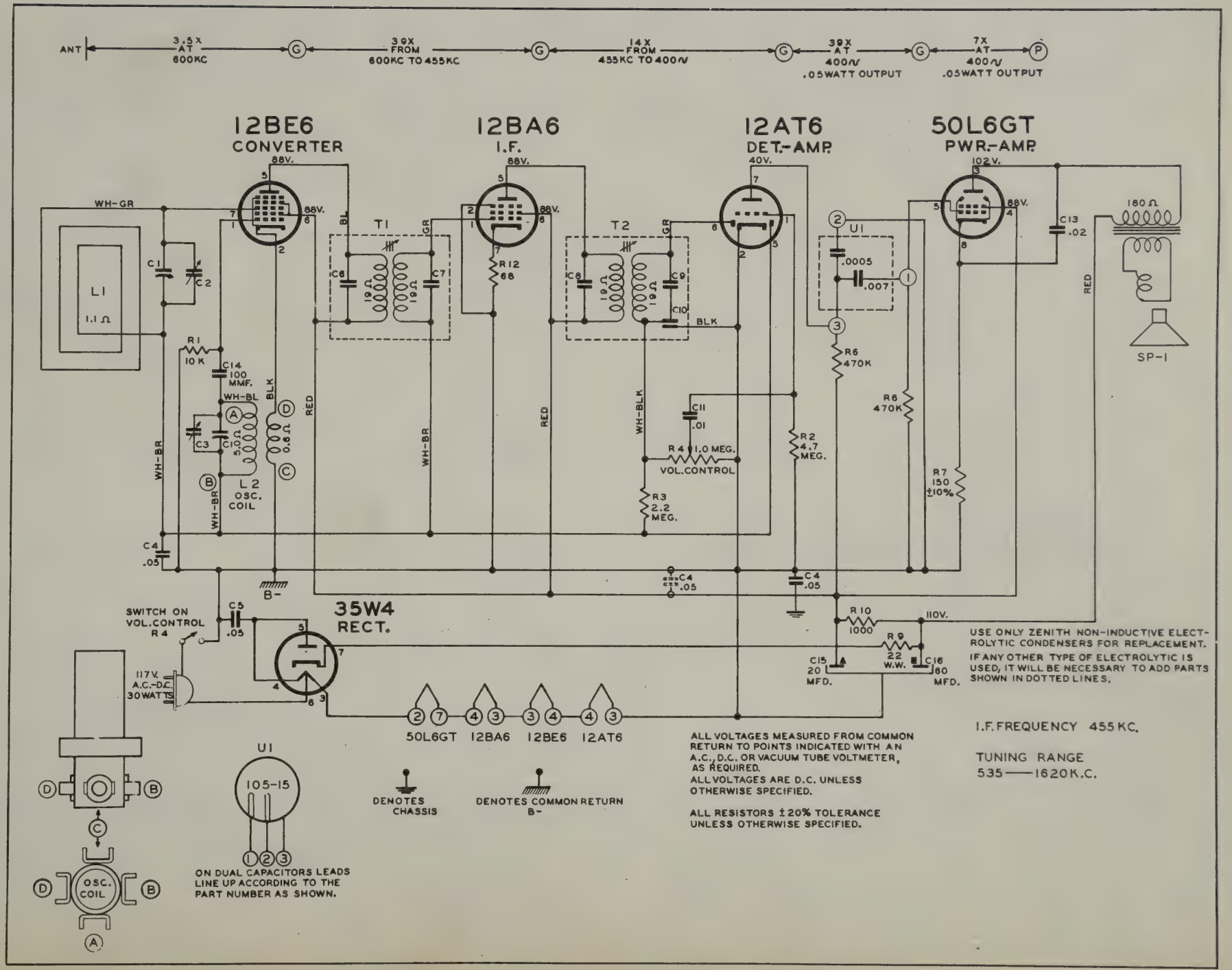
DETAILED VIEW OF I. F. TRANSFORMERS.



DIAL CABLE DRAWING


2 TURNS OF STRING ON POINTER PULLEY
1/2 TURN OF STRING ON PULLEY
POINTER
FRONT
ARROWS INDICATE DIRECTION OF STRING ON PULLEYS.
THIS SPRING ON SMALL PULLEY
THESE SPRINGS ON LARGE PULLEY
FRONT
SHAFT IN COMPLETE CLOCKWISE ROTATION
1 1/2 TURNS OF STRING

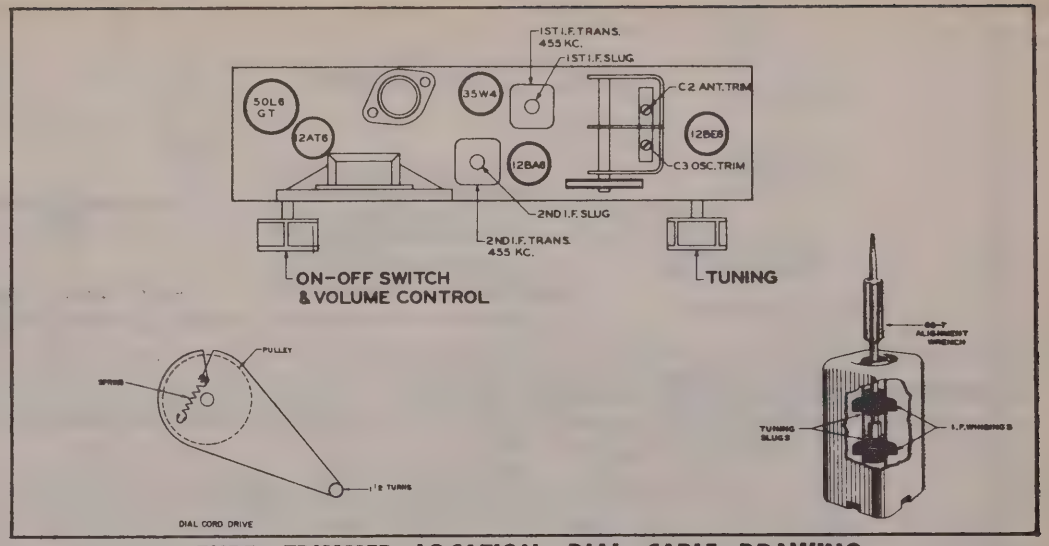
DIAL CORD DRIVE



MODEL G510 CHASSIS 5G02

PARTS LIST

PART NO.		
		DIAL ASSEMBLY
26-432		Dial Scale
59-236		Dial Pointer
76-515		Tuning Shaft
80-209		Dial Cord Tension Spring
188-32		Retaining Ring
S-14843		Dial Cord & Eyelet Assem.
		COILS & CHOKES
95-1101	T-1	1st I. F. Transformer
95-1102	T-2	2nd I. F. Transformer.
S-14842	L-2	Oscillator Coil Assem.
		CONDENSERS
22-5	C-14	110 MMfd. 500V
22-196	C-11	.01 Mfd. 600V
22-829	C-4	.05 Mfd. 200V
22-1379	C-13	.02 Mfd. 400V
22-1017	C-5	.05 Mfd. 400V
22-1804	C15, 16	Dry Electrolytic 60 x 20 Mfd. 150V
22-2152	C-1	Two Section Gang
105-15	U-1	Dual Ceramic
		RESISTORS
63-1977	R-7	150 Ohm W.W. Insl. . . . 1W
63-1219	R-9	22 Ohm W.W. Insl. . . . 1/2 W
63-1574	R-10	1 M Ohm Insl. 1W
63-1660	R-4	Vol. Con. & Sw.
63-1737	R-12	68 Ohm Insl. . . . . 1/2 W
63-1828	R-1	10M Ohm Insl. . . . . 1/2 W
63-1898	R-6	470M Ohm Insl. . . . . 1/2 W
63-1926	R-3	2.2 Megohm Insl. . . . . 1/2 W
63-1940	R-2	4.7 Megohm Insl. . . . . 1/2 W
		MISCELLANEOUS
11-79		Line Cord & Plug (6 Ft.)
14-1010		Model G510Y Plastic Cabinet
14-1209		Model G510 Plastic Cabinet
46-745		Tuning & Vol. Con. Knob (2 used) (Model G510)
46-745Y		Tuning & Vol. Con. Knob (2 used) (Model G510Y).
49-645	SP-1	4" P.M. Speaker.
		206-645 Output Trans.
		208-645 Cone & Voice Coil
54-139		#3/8-32 x 9/16 Palnut
54-211		Speed Nut
54-267		#6-32 x 5/16 Palnut
57-1614		Cabinet Front Grille.
78-275		Socket-Electrolytic
78-611		Socket - Octal Tube (8 Contact)
78-806		Socket - Miniature Tube.
78-807		Socket - Miniature Tube (3 Used)
83-1057		Line Cord Insulating Strip
94-334		Gang Cond. Mtg. Bushing
112-697		#6 x 7/16 Straight Side B.H.S.T. Screw
114-67		#6-32 x 7/16 Hex Acord Hd. M.S.
114-217		#8 x 1/4 Hex Hd. Slotted S.T. Screw
125-17		Rubber Grommet
139		Spk. Baffle
159-69		Trimount Stud (Cab. Back Mtg.)
166-44		Rubber Bumper (or 166-41)
202-773		Instruction Book
S-14879	L-1	Wavemagnet Assem.
S-16474		Front Grille & Spk. Baffle Assem.



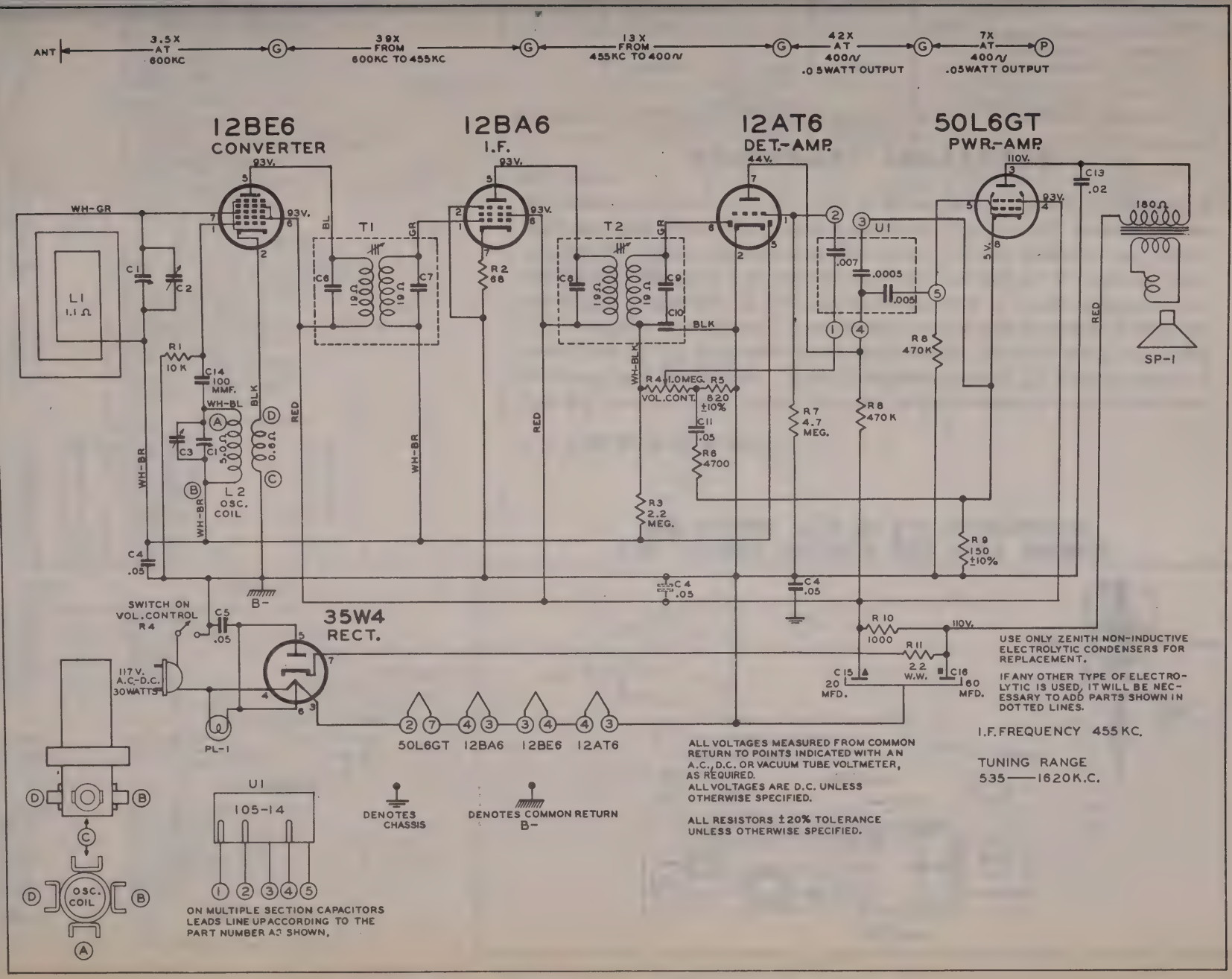
TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

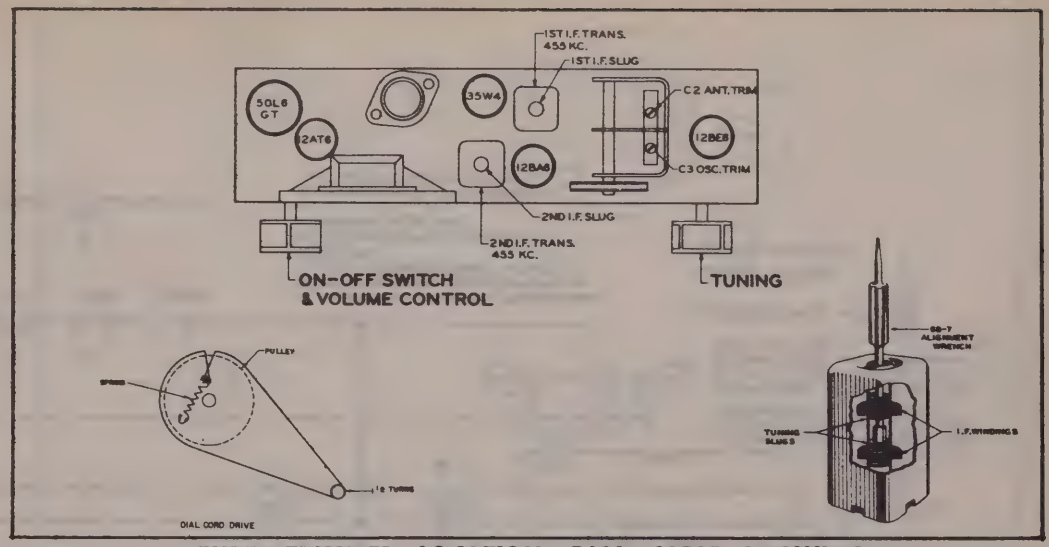
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage



MODEL G511 CHASSIS 5G01

PARTS LIST

PART NO.		
		DIAL ASSEMBLY
26-433		Dial Scale
59-236		Dial Pointer
76-515		Tuning Shaft
78-820		Pilot Light Socket & Wire
80-209		Dial Cord Tension Spring
100-67		Dial Light Bulb - 6.3V .15 amp.
188-32		Retaining Ring
S-14843		Dial Cord & Eyelet Assem.
		COILS & CHOKES
95-1101		1st I. F. Transformer
95-1102		2nd I. F. Transformer
S-14842		Osc. Coil Assem.
		CONDENSERS
22-5	C-14	110 Mmfd. 500V
22-829	C-4	.05 Mfd. 200V
22-1158	C-11	.05 Mfd. 200V
22-1379	C-13	.02 Mfd. 400V
22-1017	C-5	.05 Mfd. 400V
22-1804	C-15, 16	Dry Electrolytic 60 x 20 Mfd. 150V
22-2152	C-1	Two Section Gang
105-14	U-1	Dual Ceramic
		RESISTORS
63-1977	R-9	150 Ohm W.W. Insl. 1 W.
63-1219	R-11	22 Ohm W.W. Insl. 1/2 W
63-1574	R-10	10000 Ohm Insl. 1 W.
63-1660	R-4	Vol. Con. & Sw.
63-1737	R-2	68 Ohm Insl. 1/2 W
63-1782	R-5	820 Ohm Insl. 1/2 W
63-1814	R-6	4700 Ohm Insl. 1/2 W
63-1828	R-1	10M Ohm Insl. 1/2 W
63-1898	R-8	470M Ohm Insl. 1/2 W
63-1926	R-3	2.2 Megohm Insl. 1/2 W
63-1940	R-7	4.7 Megohm Insl. 1/2 W
		MISCELLANEOUS
11-79		Line Cord & Plug.(6 Ft.)
14-1011		Model G511 Plastic Cabinet
14-1011W		Model G511W Plastic Cabinet
14-1011Y		Model G511Y Plastic Cabinet
43-165		Handle Housing
46-744		Tuning or Vol. Con. Knob (2 used) (G511)
46-744Y		Tuning or Vol. Con. Knob (2 used) (G511W-G511Y)
49-645	SP-1	4" P.M. Speaker.
		206-645 Output Trans.
		208-645 Cone & Voice Coil
54-211		Speed Nut
57-1614		Cabinet Front Grille.
78-275		Socket - Electrolytic
78-611		Socket - Octal Tube (8 Contact)
78-806		Socket - Miniature Tube.
78-807		Socket - Miniature Tube.
83-1057		Line Cord Insulating Strip.
83-1393		Rubber Strip (Handle)
93-487		1/16 x .144 x 3/8 Steel Washer
94-334		Gang Cond. Mtg. Bushing
112-697		#6 x 7/16 Straight Side B.H.S.T. Screw
114-67		#6-32 x 7/16 Hex Acorn Hd. M.S. (3 Used)
114-217		#8 x 1/4 Hex Hd. Slotted S.T. Screw (2 Used)
125-17		Rubber Grommet
139-83		Spk. Baffle
159-69		Trimount Stud (Cab. Back Mtg.).
166-44		Rubber Bumper (or 166-41)
199-103		Flexible Handle Sleeve (G511).
199-103Y		Flexible Handle Sleeve (G511W-511Y)
202-773		Instruction Book
S-13210		Strip & Rivet Assem. (Handle Strap)
S-16471		Front Grille & Spk. Baffle Assem.
S-14976	L-1	Wavemagnet Assem. (G511-G511Y).
S-14977	L-1	Wavemagnet Assem. (G511W).



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I. F. Alignment
2	One Turn Loop Coupled Loosely to	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3			1400 Kc.	1400 Kc.	C-2	Align Antenna

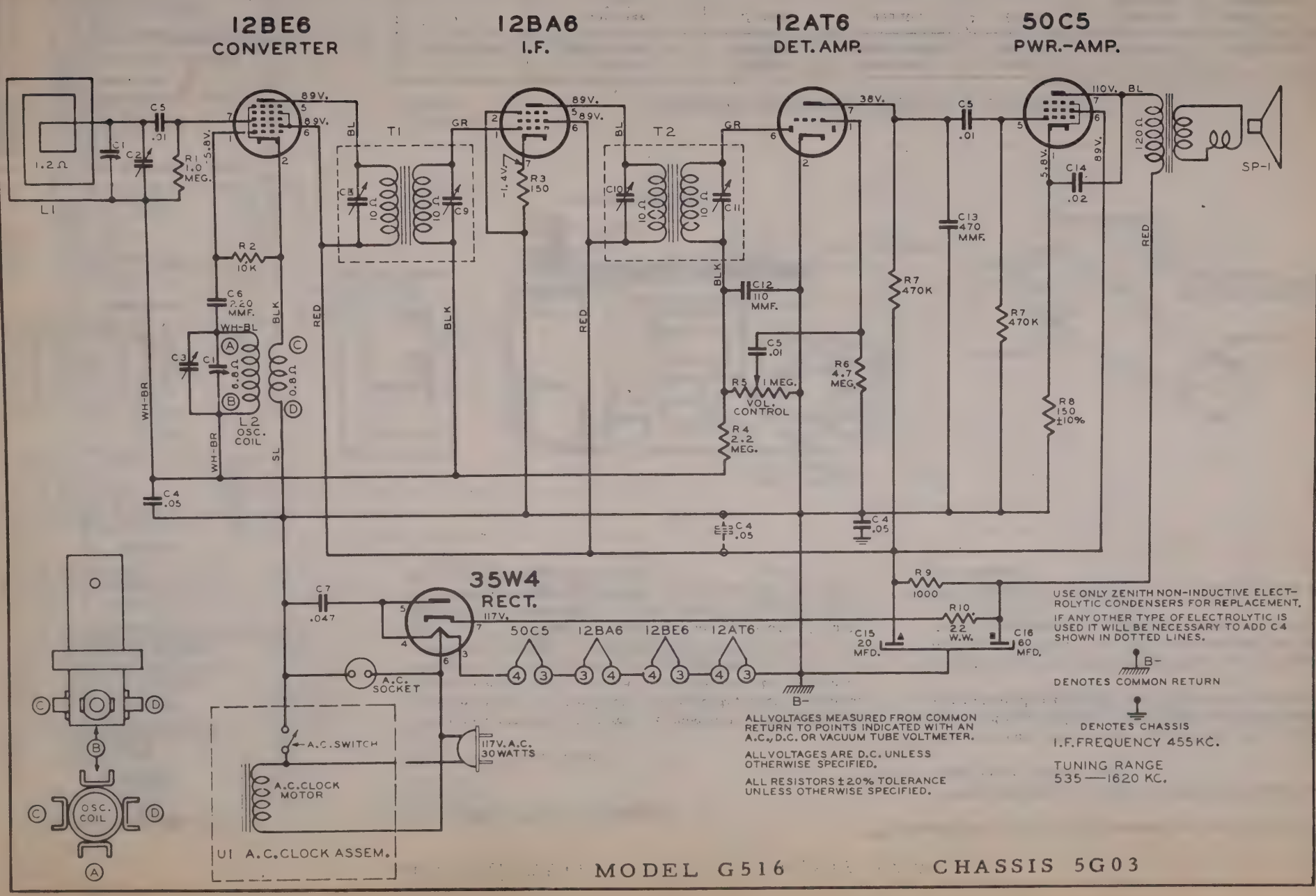
600KC.

600KC. TO 455KC.

455KC TO 400~

400~ .05 WATT OUTPUT

400~ .05 WATT OUTPUT



MODEL G516 CHASSIS 5G03

PARTS LIST

DIAL ASSEMBLY

26-444		Dial Scale	1.00
46-854		Volume Control Knob	.10
46-856		Tuning Control Knob	.10
46-861		Volume Control Knob (W & Y Model)	.10
46-862		Tuning Control Knob (W & Y Model)	.10
59-244		Dial Pointer	.25
59-246		Dial Pointer (W & Y Model)	.25
80-402		Dial Cord Tension Spring	.03
80-746		Pointer Pulley Retaining Spring	.02
S-16689		Pointer Pulley & Shaft Assembly	.25
S-16696		Pulley Mtg. Strip & Bushing Assembly	.10
S-16697		Dial Cord Assembly	.06
S-16728	U1	Clock & Timer Assembly (Complete)	13.50
S-16774	U1	Clock & Timer Assembly (W Model) Complete	13.50
S-16775	U1	Clock & Timer Assembly (Y Model) Complete	13.50

COILS & CHOKES

95-1230	T1	1st. I. F. Transformer	1.75
95-1231	T2	2nd. I. F. Transformer	1.75
S-16681	L2	Osc. Coil Assembly	.60

CONDENSERS

22-3	4C5	.01 Mfd. Ceramic (3 used)	500V	.26
22-5	C12	110 Mmfd. Ceramic (or 22-162)	500V	.26
22-6	C13	470 Mmfd. Ceramic (or 22-1196)	500V	.26
22-182	C6	220 Mmfd. Molded Mica	500V	.26
22-829	C4	.05 Mfd. (2 used)	200V	.20
22-1017	C7	.05 Mfd.	400V	.20
22-1379	C14	.02 Mfd.	400V	.20
22-2202	C15, C16	Elect. 20-60 Mfd.	150V	2.00
22-2209	C1	Two Gang Variable		3.50

RESISTORS

63-1219	R10	22 Ohm W.W. 1/2W 20% Ins.	.21
63-1574	R9	1000 Ohm 1W 20% Ins.	.24
63-1751	R3	150 Ohm 1/2W 20% Ins.	.21
63-1828	R2	10K Ohm 1/2W 20% Ins.	.21
63-1898	R7	470K Ohm 1/2W 20% Ins.	.21
63-1912	R1	1 Megohm 1/2W 20% Ins.	.21
63-1926	R4	2.2 " 1/2W 20% Ins.	.21
63-1940	R6	4.7 " 1/2W 20% Ins.	.21
63-1977	R8	150 Ohm 1W 10% Ins.	.24
63-2106	R5	Volume Control	1.20

MISCELLANEOUS

11-85	Line Cord & Plug (6 ft.)	.65
14-1234	Plastic Cabinet for G516	4.50
14-1237	Plastic Cabinet for G516 White	6.50
14-1238	Plastic Cabinet for G516 Black	4.50
16-603	Packing Carton	---
24-541	Volume Control Cover	.07
49-680	SP-1 4" P. M. Speaker	6.00
	*208-680 Cone & Voice Coil	1.73
	*206-680 Output Transformer	1.67
54-139	3/8-32 x 9/16 Hex Palnut	.01
54-227	#4-40 x 1/4 Hex Nut Steel (3 used to Mount Clock)	.01
54-271	6-32 x 1/4 Hex Palnut Steel (2 used on each 95-1230 & 95-1231)	.01
57-1613	Emblem Plate	.20
78-275	Elect. Cond. Socket	.03
78-781	Miniature Tube Socket (2 used)	.20
78-782	Miniature Tube Socket (5 used)	.25
78-840	Two Prong Socket (A.C.)	.30
93-501	#4 Int. Shakeproof Lockwasher (3 used on Clock Mtg.)	.32C
94-334	Gang Mtg. Bushing (3 used)	.67C
110-150	Grill Cloth	.10
113-15	6-32 x 5/16" Hex Hd. M.S. (3 used on Gang Cond. Mtg.)	.02
114-253	#6 x 3/8 Hex Hd. Sl. S. T. (2 used Chassis Mtg.)	.84C
114-343	#8 x 1/2 Hex Hd. Sl. Washer Hd. S. T. (2 used Chassis Mtg.)	.03
125-17	Rubber Grommet (3 used Gang Mtg.)	.03
159-69	Trimount Stud (4 used Back Mtg.)	.01
202-805	Instruction Book	.15
S-16729	L1 Wavemagnet & Back Assem. (Walnut & Black Models)	1.25
S-16768	Clock Cover & Bushing (Rear)	.50
S-16776	Wavemagnet & Back Assem. (White Models)	1.25
S-17001	Twisted Wire Cable Assembly	.15

*All prices shown are suggested list prices and subject to change

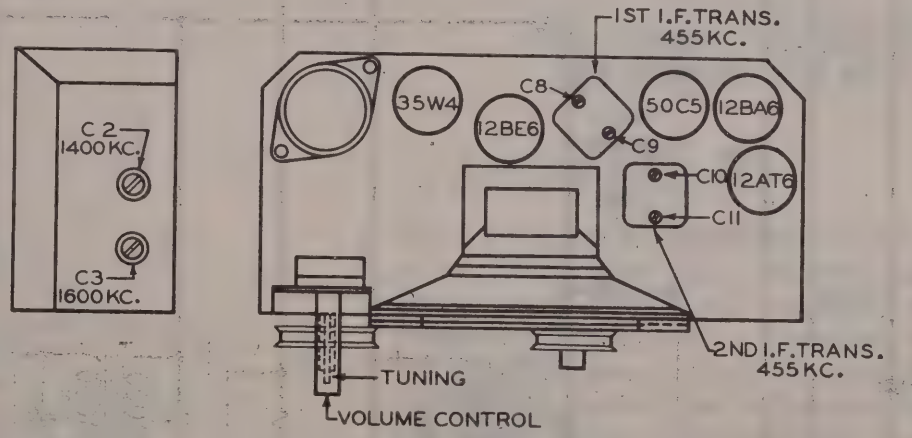
TO THE SERVICEMAN:

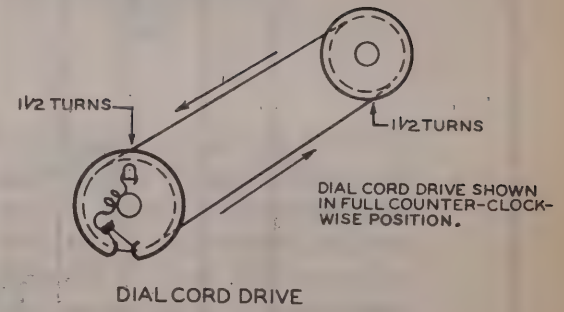
Clock and Timer Note:

The clock and timer assemblies used in this receiver are manufactured by Telechron. Face parts, such as hands, knobs, scales, bezel, etc., are not available through local Telechron service depots. We suggest that all clock and timer assemblies complete (less the rear cover and bushing - S-16768) be returned to your local Zenith Distributor for repair or replacement. Be sure to pack all clock and timer assemblies individually and carefully to prevent damage in shipment.

To remove the clock from the cabinet proceed as follows:

1. Remove the three 6/32 hex nuts that fasten the rear clock cover to the clock.
2. Slide the rear clock cover off the time set control shaft and then slide this cover down over the three-wire cable that connects the clock to the receiver.
3. Next unsolder the three-wire cable from the clock motor and switch. Be certain not to tear out the solder terminals from the clock motor or switch.
4. The clock can then be removed from the front of the cabinet.

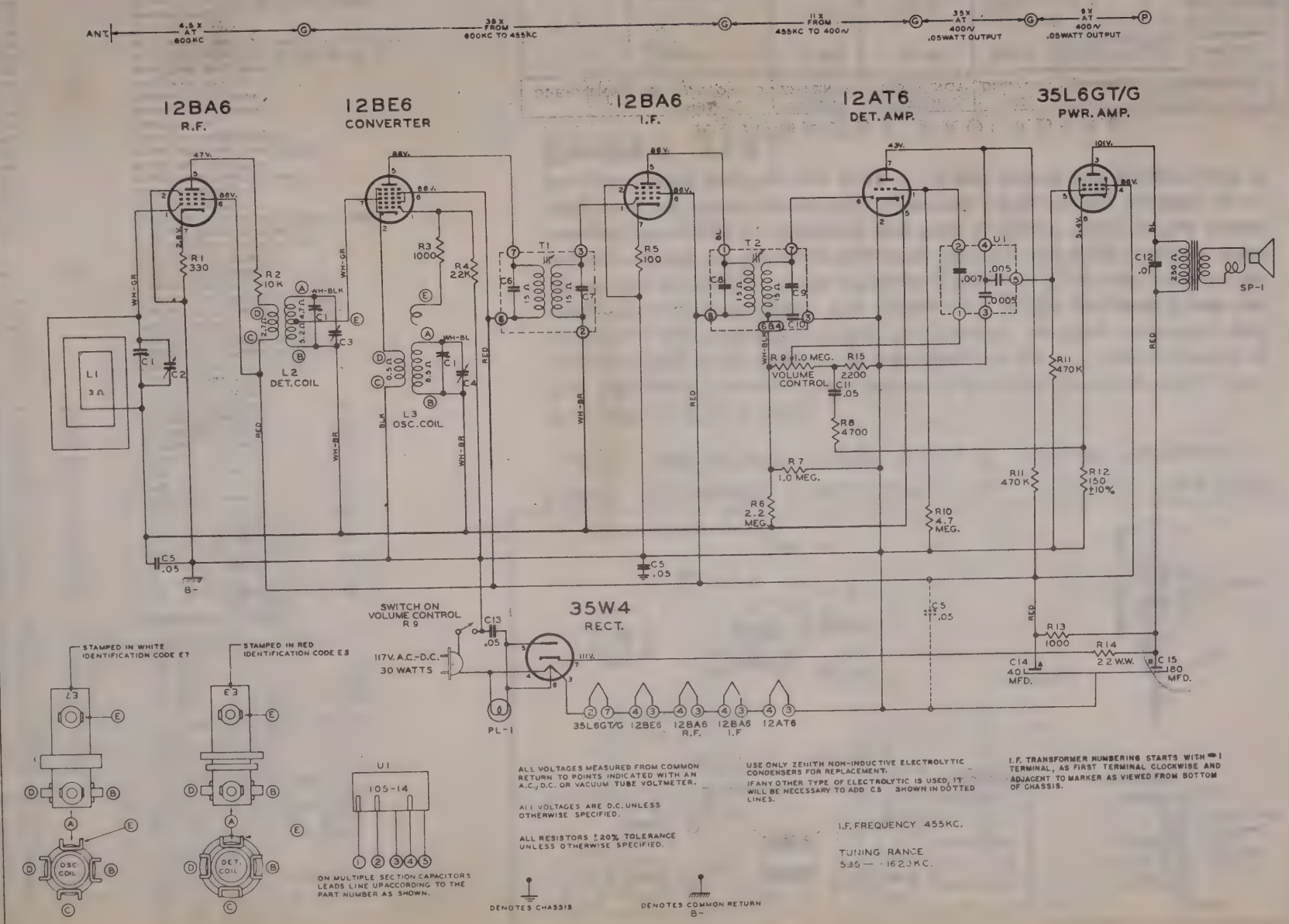




DIAL CORD DRIVE

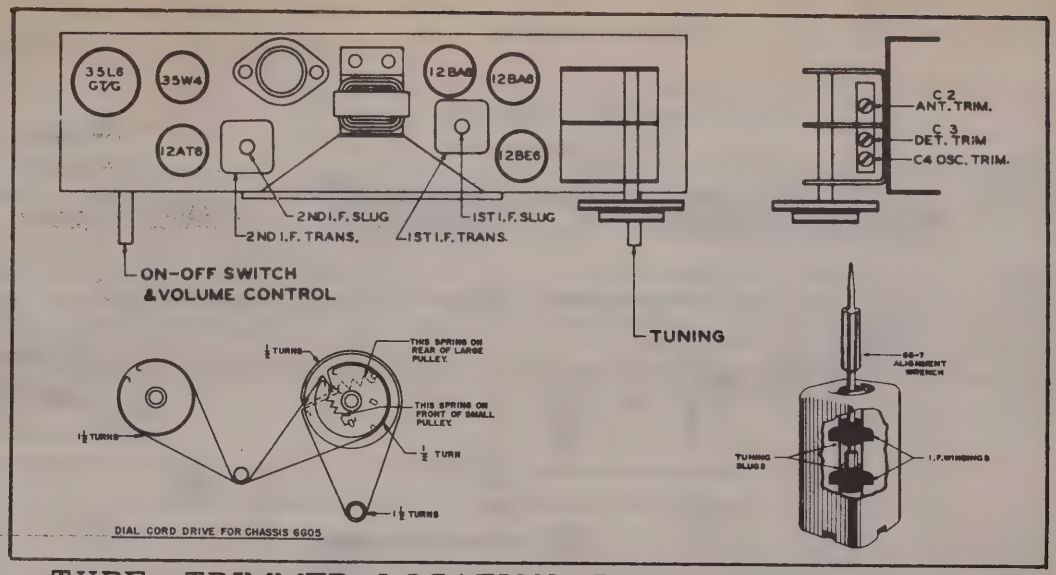
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C8, C9, C10, C11	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	---	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale
3						Align Antenna


ANT.
4.5 X AT 600 KC
38 X FROM 600 KC TO 455 KC
11 X FROM 455 KC TO 400 N
35 X AT 400 N .05 WATT OUTPUT
9 X AT 400 N .05 WATT OUTPUT
12BA6 R.F.
12BE6 CONVERTER
12BA6 I.F.
12AT6 DET. AMP.
35L6GT/G PWR. AMP.
35W4 RECT.
L1 3Ω
L2 DET. COIL
L3 OSC. COIL
T1
T2
U1
SP-1
PL-1
R1 330
R2 10K
R3 1000
R4 22K
R5 100
R6 2.2 MEG.
R7 1.0 MEG.
R8 4700
R9 1.0 MEG. VOLUME CONTROL
R10 4.7 MEG.
R11 470K
R12 150 ±10%
R13 1000
R14 22 W.W.
R15 2200
C1
C2
C3
C4
C5 .05
C6
C7
C8
C9
C10 68
C11 .05
C12 .01
C13 .05
C14 40 MFD.
C15 180 MFD.
.007
.005
.0005
250 Ω
SWITCH ON VOLUME CONTROL R9
117 V. A.C.-D.C. 30 WATTS
35L6GT/G 12BE6 12BA6 R.F. 12BA6 I.F 12AT6
STAMPED IN WHITE IDENTIFICATION CODE E7
STAMPED IN RED IDENTIFICATION CODE E3
OSC COIL
DET. COIL
U1
105-14
ON MULTIPLE SECTION CAPACITORS LEADS LINE UP ACCORDING TO THE PART NUMBER AS SHOWN.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
DENOTES COMMON RETURN B-
USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT.
IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT WILL BE NECESSARY TO ADD C5 SHOWN IN DOTTED LINES.
I.F. FREQUENCY 455 KC.
TUNING RANGE 535 — 1620 KC.
I.F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL, AS FIRST TERMINAL CLOCKWISE AND ADJACENT TO MARKER AS VIEWED FROM BOTTOM OF CHASSIS.

PARTS LIST

PART NO.	REF.NO.	DESCRIPTION	
		DIAL ASSEMBLY	
26-434		Dial Scale	
59-238		Dial Pointer	
76-519		Tuning Shaft	
78-822		Dial Light Socket and Wire	
80-69		Dial Cord Tension Spring	
80-209		Dial Cord Tension Spring	
97-284		Dial Cord Guide Stud	
100-67	PL-1	Dial Light Bulb - 6.3 VC .15 Amp.	
188-32		Retaining Ring	
188-60		Retaining Ring	
S-14834		Dial Cord and Eyelet Assy. (Short)	
S-16593		Dial Cord and Eyelet Assy. (Long)	
S-14867		Pointer Pulley and Bushing Assy.	
S-14868		Pointer Pulley Bracket and Stud Assy.	
		COILS & CHOKES	
95-1101	T1	1st I.F. Transformer	
95-1102	T2	2nd I.F. Transformer	
S-14832	L2	Detector Coil Assembly	
S-14833	L3	Oscillator Coil Assembly	
		CONDENSERS	
22-178	C-11	.05 Mfd.	200V
22-829	C-5	.05 Mfd.	200V
22-1182	C-12	.01 Mfd.	400V
22-1017	C-13	.05 Mfd.	400V
22-1805	C-1	Three Section Gang	
22-1808	C-14,15	Dry Electrolytic 80 x 40 Mfd.	150V
105-14	U-1	Multiple Capacitor Unit	
		RESISTORS	
63-1977	R12	150 Ohm Insulated	1W
63-1219	R14	22 Ohm W.W. Insulated	1/2W
63-1574	R13	1M Ohm Insulated	1W
63-1664	R9	Volume Control and Switch	
63-1744	R5	100 Ohm Insulated	1/2W
63-1765	R1	330 Ohm Insulated	1/2W
63-1786	R3	1M Ohm Insulated	1/2W
63-1814	R8	4700 Ohm Insulated	1/2W
63-1828	R2	10M Ohm Insulated	1/2W
63-1842	R4	22M Ohm Insulated	1/2W
63-1898	R11	470M Ohm Insulated	1/2W
63-1912	R7	1 Megohm Insulated	1/2W
63-1926	R6	2.2 Megohm Insulated	1/2W
63-1940	R10	4.7 Megohm Insulated	1/2W
63-1800	R15	2200 Ohm Insulated	1/2W
		MISCELLANEOUS	
11-85		Line Cord and Plug	
14-1015		Model G615 Plastic Cabinet	
14-1015W		Model G615W Plastic Cabinet	
14-1015Y		Model G615Y Plastic Cabinet	
43-165		Handle Housing	
46-744		Tuning & Vol. Con. Knob (2 used)	
46-744Y		Tuning & Vol. Con. Knob (2 used) (G615 & G615Y)	
49-643	SP-1	5 1/4" P. M. Speaker	
		206-643 Output Trans.	
		208-643 Cone and Voice Coil	
54-30		8-32 x 5/16 Hex Nut (Spk. Mtg.)	
54-129		Speed Nut (Used on 26-411 and 57-1409)	
57-1619		Cabinet Front Plate	
78-275		Socket Electrolytic	
78-611		Socket Octal Tube (8 Contact)	
78-806		Socket Miniature Tube	
78-807		Socket Miniature Tube (4 used)	
83-1057		Line Cord Insulating Strip	
83-1165		Handle Strap	
83-1166		Handle Strap (Slotted)	
83-1393		Handle Strip (Rubber)	
93-138		Black Felt Washer	
94-334		Gang Cond. Mtg. Bushing	
112-697		#6 x 7/16 Straight Side B.H.S.T. Screw	
114-291		#8-32 x 7/16 Hex Hd Slotted M.S. (Spk. Mtg.)	
125-17		Rubber Grommet	
139-71		Speaker Baffle	
159-69		Trimount Stud (Cab Back Mtg.) (4 used)	
166-44		Rubber Bumper (or 166-41)	
171-10		Pilot Light Lens	
199-103		Flexible Handle Sleeve	
199-103Y		Flexible Handle Sleeve (G615W & G615Y)	
202-793		Instruction Book	
S-14888	L1	Wavemagnet Assembly	
S-14978		Wavemagnet Assembly (G615W only)	



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I.F. Alignment
2	Single Turn Loosely Coupled to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-3	Detector Alignment
4		--	1400 Kc.	1400 Kc.	C-2	Antenna

PARTS LIST

G660 (CHASSIS 6G01)

DIAL ASSEMBLY

26-424		Dial Scale & Escutcheon	1.40
46-811		Tuning & Volume Control Knob (2 used)	.40
46-812		Tone Control Knob	.40
46-816		Radio-Phono Knob	.45
59-229		Dial Pointer	.40
76-556		Tuning Control Shaft	.15
78-808		Pilot Light Socket & Wire	.45
80-69		Dial Cord Tension Spring	.05
80-209		" " " "	.03
93-138		Felt Washer (Used on S-16029)	.01
100-67	PL-1	Dial Light Bulb	.10
171-10		Pilot Light Lenz	.10
S-15903		Dial Cord Assembly (Short)	.05
S15904		" " " (Long)	.06
S-16028		Pulley & Bushing Assembly	.25
S-16029		Bracket & Stud Assembly	.15

COILS & CHOKES

95-1101	T1	1st I.F. Transformer	1.60
95-1102	T2	2nd " "	1.60
S-12603	L7	Phono Oscillator Coil Assembly	.75
S-13799	L2	Oscillator Coil Assembly	.75

CONDENSERS

22-3	C-8	.01 Mfd. Ceramic (Disc) 500 V	.26
22-4	C10	.004 " " (") 500 V	.26
22-5	C5	.0001 " " (") 500 V	.26
22-178	C9	.05 " 200 V.	.20
22-289	C16	47 " (Molded) 500 V	.20
22-829	C4	.05 " 200 V	.20
22-854	C6	.0005 " 600 V	.20
22-1182	C11	.01 " 400 V	.20
22-1444	C7	.001 " 200 V	.20
22-2200	C17	39 Mmfd. Ceramic 500 V	.20
22-1775	C18	.047 Mfd. 400 V	.26
22-2085	C1	Two Gang Variable Condenser (With Pulleys)	3.00
22-2086	C12,13,14	Elect. Cond. 20 Mfd. 150 V - 40 Mfd. 150 V - 80 Mfd. 150 V	2.50

RESISTORS

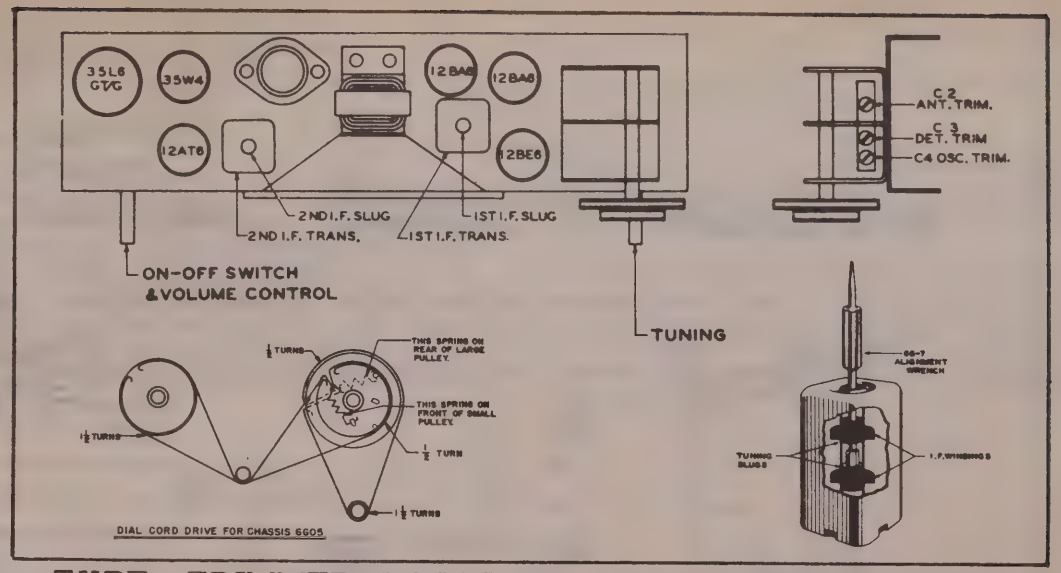
63-1219	R-14	22 ohm W.W. 1/2 W 20% Ins. Resistor	.21
63-1574	R-13	1000 " 1 W 20% " "	.24
63-1782	R-8	820 " 1/2 W 10% " "	.21
63-1814	R-11	4700 " 1/2 W 20% " "	.21
63-1828	R-2	10K " 1/2 W 20% " "	.21
63-1961	R-1	15 Megohm 1/2 W 20% Ins. Resistor	.21
63-1977	R-12	150 Ohm 1 W 10% " "	.24
63-2045	R-10	Tone Control	1.20
63-2046	R-6	Volume Control & Switch	1.81

MISCELLANEOUS

11-104		Line Cord & Plug (7 ft. Long)	.65
14-1204		Plastic Cabinet for G660	5.50
17-116		Wavemagnet Retaining Clamp	.01
19-123		Record Changer Mtg. Clip (4 used)	.10
24-512		Cabinet Top Cover	3.25
24-513		" Bottom Cover	3.00
40-87		" Cover Hinge (R.H.)	.45
40-88		" " " (L.H.)	.45
49-669	SP-1	5-1/4" P.M. Speaker	6.00
		*208-669 Cone & Voice Coil	1.73
		*206-669 Output Transformer	1.97
52-538		Two Prong Receptacle & Cable	.35
54-139		3/8-32X9/16" Palnut Cad. (1 ea. used 85-465-63-2045-63-2046)	.01
54-211		Speed Nut (4 used to mt. S-16053)	.01
54-267		6-32X5/16" Palnut Cad. (1 ea. used 95-1101-95-1102)	.45C
57-1551		Cover Plate	.90
78-229		Elect. Cond. Socket	.03
78-644		Phono Connector Socket	.12
78-806		Miniature Tube Socket (2 used)	.15
78-807		" " " (3 ")	.15
78-861		" " "	.20
83-1670		Line Cord Retaining Strip	.03
83-1671		Wavemagnet Terminal Strip	.15
85-465	S1	Phono-Radio Switch (or 85-466)	1.00
93-755		#8 Ext. Shakeproof Lockwasher (2 used on 54-30)	.40C
94-295		Gang Cond. Mtg. Bushing	.04
110-142		Grille Cloth	.10
112-773		#6X3/8 Phill. B.H.S.T. Screw Stat. Bronze (14 used)	.03
112-775		Record Changer Mtg. Screw (4 used)	.05
112-781		#8X1" Phill. B.H.S.T. Stat. Br. (6 used on 24-513)	.03
114-291		#8-32X7/16" Hex. Hd. Sl. M.S. (2 used on S-16029)	.85C
114-297		#6X1/4" Hex. Hd. Sl. S.T. (2 used on 126-624)	.01
114-333		#10-32X1/2" Hex. Washer Hd. M.S. Steel Stat. Bronze (4 used Chassis Mtg.)	.02
125-17		Rubber Grommet (3 used on Gang)	.03
125-76		" " (4 " " Changer)	.25
126-624		Heat Shield	.05
166-41		Rubber Bumper (1 used on Gang)	.03
188-32		Retaining Ring (Used on S-16028)	1.03C
188-60		" "	.02
202-743		Instruction Book (Radio-Phono)	.40
S-14023		Dual Speed Record Changer	----
S-15896		Wavemagnet Assembly	1.10

PARTS LIST

PART NO.	REF.NO.	DESCRIPTION	
		DIAL ASSEMBLY	
26-434		Dial Scale	
59-238		Dial Pointer	
76-519		Tuning Shaft	
78-822		Dial Light Socket and Wire	
80-69		Dial Cord Tension Spring	
80-209		Dial Cord Tension Spring	
97-284		Dial Cord Guide Stud	
100-67	PL-1	Dial Light Bulb - 6.3 VC .15 Amp.	
188-32		Retaining Ring	
188-60		Retaining Ring	
S-14834		Dial Cord and Eyelet Assy. (Short)	
S-16593		Dial Cord and Eyelet Assy. (Long)	
S-14867		Pointer Pulley and Bushing Assy.	
S-14868		Pointer Pulley Bracket and Stud Assy.	
		COILS & CHOKES	
95-1101	T1	1st I.F. Transformer	
95-1102	T2	2nd I.F. Transformer	
S-14832	L2	Detector Coil Assembly	
S-14833	L3	Oscillator Coil Assembly	
		CONDENSERS	
22-178	C-11	.05 Mfd.	200V
22-829	C-5	.05 Mfd.	200V
22-1182	C-12	.01 Mfd.	400V
22-1017	C-13	.05 Mfd.	400V
22-1805	C-1	Three Section Gang	
22-1808	C-14,15	Dry Electrolytic 80 x 40 Mfd.	150V
105-14	U-1	Multiple Capacitor Unit	
		RESISTORS	
63-1977	R12	150 Ohm Insulated	1W
63-1219	R14	22 Ohm W.W. Insulated	1/2W
63-1574	R13	1M Ohm Insulated	1W
63-1664	R9	Volume Control and Switch	
63-1744	R5	100 Ohm Insulated	1/2W
63-1765	R1	330 Ohm Insulated	1/2W
63-1786	R3	1M Ohm Insulated	1/2W
63-1814	R8	4700 Ohm Insulated	1/2W
63-1828	R2	10M Ohm Insulated	1/2W
63-1842	R4	22M Ohm Insulated	1/2W
63-1898	R11	470M Ohm Insulated	1/2W
63-1912	R7	1 Megohm Insulated	1/2W
63-1926	R6	2.2 Megohm Insulated	1/2W
63-1940	R10	4.7 Megohm Insulated	1/2W
63-1800	R15	2200 Ohm Insulated	1/2W
		MISCELLANEOUS	
11-85		Line Cord and Plug	
14-1015		Model G615 Plastic Cabinet	
14-1015W		Model G615W Plastic Cabinet	
14-1015Y		Model G615Y Plastic Cabinet	
43-165		Handle Housing	
46-744		Tuning & Vol. Con. Knob (2 used)	
46-744Y		Tuning & Vol. Con. Knob (2 used) (G615 & G615Y)	
49-643	SP-1	5 1/4" P. M. Speaker	
		206-643 Output Trans.	
		208-643 Cone and Voice Coil	
54-30		8-32 x 5/16 Hex Nut (Spk. Mtg.)	
54-129		Speed Nut (Used on 26-411 and 57-1409)	
57-1619		Cabinet Front Plate	
78-275		Socket Electrolytic	
78-611		Socket Octal Tube (8 Contact)	
78-806		Socket Miniature Tube	
78-807		Socket Miniature Tube (4 used)	
83-1057		Line Cord Insulating Strip	
83-1165		Handle Strap	
83-1166		Handle Strap (Slotted)	
83-1393		Handle Strip (Rubber)	
93-138		Black Felt Washer	
94-334		Gang Cond. Mtg. Bushing	
112-697		#6 x 7/16 Straight Side B.H.S.T. Screw	
114-291		#8-32 x 7/16 Hex Hd Slotted M.S. (Spk. Mtg.)	
125-17		Rubber Grommet	
139-71		Speaker Baffle	
159-69		Trimount Stud (Cab Back Mtg.) (4 used)	
166-44		Rubber Bumper (or 166-41)	
171-10		Pilot Light Lens	
199-103		Flexible Handle Sleeve	
199-103Y		Flexible Handle Sleeve (G615W & G615Y)	
202-793		Instruction Book	
S-14888	L1	Wavemagnet Assembly	
S-14978		Wavemagnet Assembly (G615W only)	



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

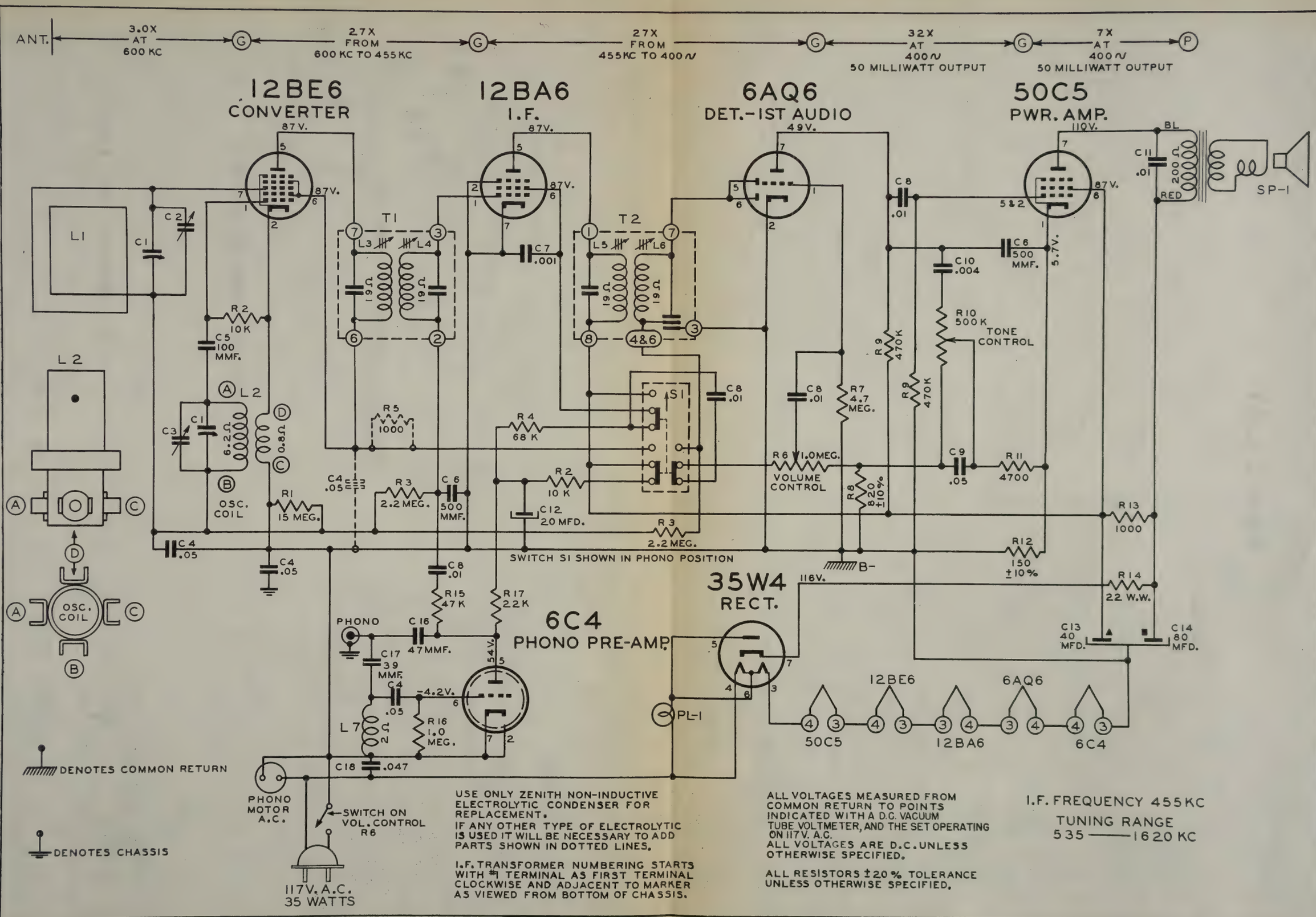
TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I.F. Alignment
2	Single Turn Loosely Coupled to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-3	Detector Alignment
4		--	1400 Kc.	1400 Kc.	C-2	Antenna Alignment

MODELS G660, G663, G670, G673
CHASSIS 6G01



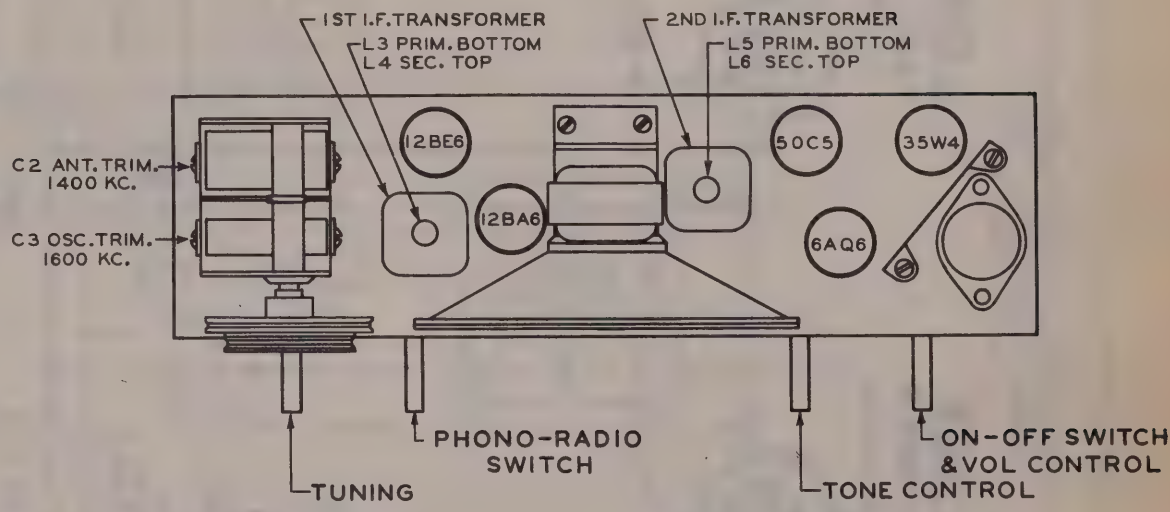
63-1856	R-15	47K	1/2 W	20%	
63-1863	R-4	68K	1/2 W	20%	
63-1898	R-9	470K	1/2 W	20%	
63-1912	R-16	1.0 Megohm	1/2 W	20%	
63-1926	R-3	2.2 Megohm	1/2 W	20%	
63-1940	R-7	4.7	1/2 W	20%	

.21
.21
.21
.21
.21
.21

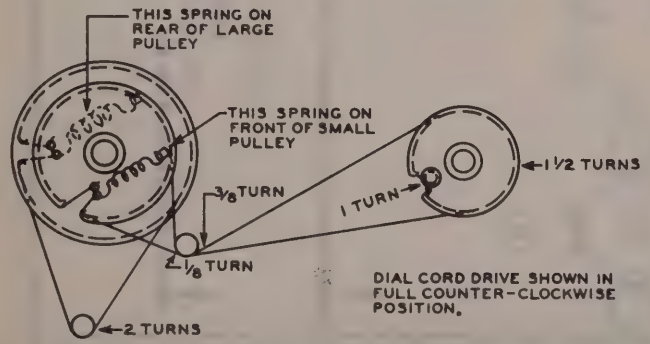
Prices shown are suggested list prices and are subject to change without notice.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.



TUBE AND TRIMMER LOCATION


THIS SPRING ON REAR OF LARGE PULLEY
THIS SPRING ON FRONT OF SMALL PULLEY
3/8 TURN
1 TURN
1 1/2 TURNS
2 1/8 TURN
2 TURNS
DIAL CORD DRIVE SHOWN IN FULL COUNTER-CLOCKWISE POSITION.

DIAL CABLE DRAWING AND DETAIL OF I. F. TRANSFORMER

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3, 4, 5, 6	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

MODEL G723
CHASSIS 7G04

1/12/50

TO THE SERVICE MAN:

The 7G04 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7G04 or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

FM-AM 1st IF Alignment: The alignment of the 1st IF transformer is conventional. The alignment slugs are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible. The 2nd AM and FM IF transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

G660 (CHASSIS 6G01)

DIAL ASSEMBLY

26-424		Dial Scale & Escutcheon	1.40
46-811		Tuning & Volume Control Knob (2 used)	.40
46-812		Tone Control Knob	.40
46-816		Radio-Phono Knob	.45
59-229		Dial Pointer	.40
76-556		Tuning Control Shaft	.15
78-808		Pilot Light Socket & Wire	.45
80-69		Dial Cord Tension Spring	.05
80-209		" " " "	.03
93-138		Felt Washer (Used on S-16029)	.01
100-67	PL-1	Dial Light Bulb	.10
171-10		Pilot Light Lenz	.10
S-15903		Dial Cord Assembly (Short)	.05
S15904		" " " (Long)	.06
S-16028		Pulley & Bushing Assembly	.25
S-16029		Bracket & Stud Assembly	.15

COILS & CHOKES

95-1101	T1	1st I.F. Transformer	1.60
95-1102	T2	2nd " "	1.60
S-12603	L7	Phono Oscillator Coil Assembly	.75
S-13799	L2	Oscillator Coil Assembly	.75

CONDENSERS

22-3	C-8	.01 Mfd. Ceramic (Disc) 500 V	.26
22-4	C10	.004 " " (") 500 V	.26
22-5	C5	.0001 " " (") 500 V	.26
22-178	C9	.05 " 200 V	.20
22-289	C16	47 " (Molded) 500 V	.20
22-829	C4	.05 " 200 V	.20
22-854	C6	.0005 " 600 V	.20
22-1182	C11	.01 " 400 V	.20
22-1444	C7	.001 " 200 V	.20
22-2200	C17	39 Mmfd. Ceramic 500 V	.20
22-1775	C18	.047 Mfd. 400 V	.26
22-2085	C1	Two Gang Variable Condenser (With Pulleys)	3.00
22-2086	C12,13,14	Elect. Cond. 20 Mfd. 150 V - 40 Mfd. 150 V - 80 Mfd. 150 V	2.50

RESISTORS

63-1219	R-14	22 ohm W.W. 1/2 W 20% Ins. Resistor	.21
63-1574	R-13	1000 " 1 W 20% " "	.24
63-1782	R-8	820 " 1/2 W 10% " "	.21
63-1814	R-11	4700 " 1/2 W 20% " "	.21
63-1828	R-2	10K " 1/2 W 20% " "	.21
63-1842	R-17	22K " 1/2 W 20% " "	.21
63-1856	R-15	47K " 1/2 W 20% " "	.21
63-1863	R-4	68K " 1/2 W 20% " "	.21
63-1898	R-9	470K " 1/2 W 20% " "	.21
63-1912	R-16	1.0 Megohm 1/2 W 20% " "	.21
63-1926	R-3	2.2 Megohm 1/2 W 20% " "	.21
63-1940	R-7	4.7 " 1/2 W 20% " "	.21
63-1961	R-1	15 Megohm 1/2 W 20% Ins. Resistor	.21
63-1977	R-12	150 Ohm 1 W 10% " "	.24
63-2045	R-10	Tone Control	1.20
63-2046	R-6	Volume Control & Switch	1.81

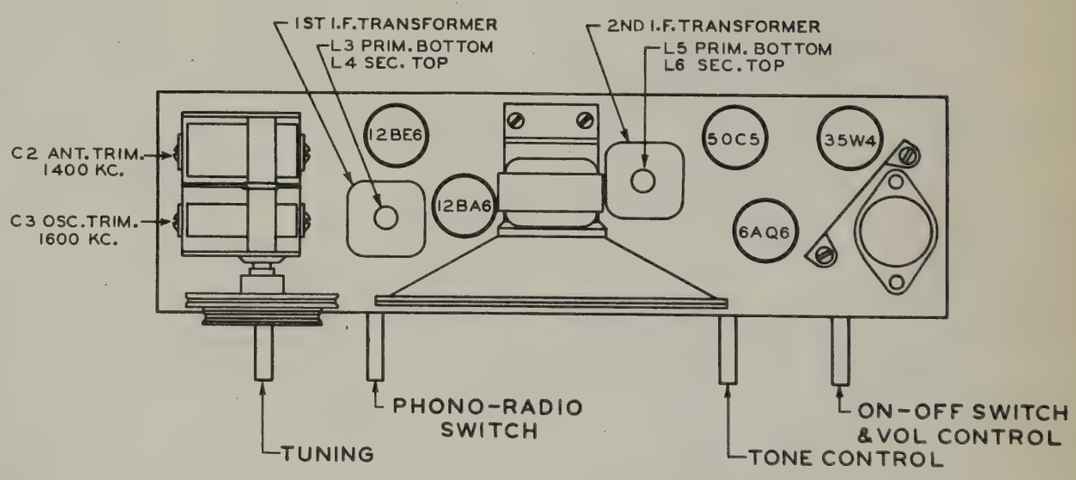
MISCELLANEOUS

11-104		Line Cord & Plug (7 ft. Long)	.65
14-1204		Plastic Cabinet for G660	5.50
17-116		Wavemagnet Retaining Clamp	.01
19-123		Record Changer Mtg. Clip (4 used)	.10
24-512		Cabinet Top Cover	3.25
24-513		" Bottom Cover	3.00
40-87		" Cover Hinge (R.H.)	.45
40-88		" " " (L.H.)	.45
49-669	SP-1	5-1/4" P.M. Speaker	6.00
		*208-669 Cone & Voice Coil	1.73
		*206-669 Output Transformer	1.97
52-538		Two Prong Receptacle & Cable	.35
54-139		3/8-32X9/16" Palnut Cad. (1 ea. used 85-465-63-2045-63-2046)	.01
54-211		Speed Nut (4 used to mt. S-16053)	.01
54-267		6-32X5/16" Palnut Cad. (1 ea. used 95-1101-95-1102)	.45C
57-1551		Cover Plate	.90
78-229		Elect. Cond. Socket	.03
78-644		Phono Connector Socket	.12
78-806		Miniature Tube Socket (2 used)	.15
78-807		" " " (3 ")	.15
78-861		" " "	.20
83-1670		Line Cord Retaining Strip	.03
83-1671		Wavemagnet Terminal Strip	.15
85-465	S1	Phono-Radio Switch (or 85-466)	1.00
93-755		#8 Ext. Shakeproof Lockwasher (2 used on 54-30)	.40C
94-295		Gang Cond. Mtg. Bushing	.04
110-142		Grille Cloth	.10
112-773		#6X3/8 Phill. B.H.S.T. Screw Stat. Bronze (14 used)	.03
112-775		Record Changer Mtg. Screw (4 used)	.05
112-781		#8X1" Phill. B.H.S.T. Stat. Br. (6 used on 24-513)	.03
114-291		#8-32X7/16" Hex. Hd. Sl. M.S. (2 used on S-16029)	.85C
114-297		#6X1/4" Hex. Hd. Sl. S.T. (2 used on 126-624)	.01
114-333		#10-32X1/2" Hex. Washer Hd. M.S. Steel Stat. Bronze (4 used Chassis Mtg.)	.02
125-17		Rubber Grommet (3 used on Gang)	.03
125-76		" " (4 " " Changer)	.25
126-624		Heat Shield	.05
166-41		Rubber Bumper (1 used on Gang)	.03
188-32		Retaining Ring (Used on S-16028)	1.03C
188-60		" "	.02
202-743		Instruction Book (Radio-Phono)	.40
S-14023		Dual Speed Record Changer	----
S-15896		Wavemagnet Assembly	1.10
S-16053		Speaker Baffle Assembly	.50

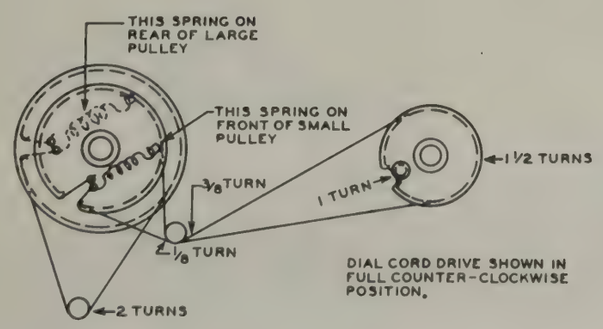
Prices shown are suggested list prices and are subject to change without notice.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.



TUBE AND TRIMMER LOCATION

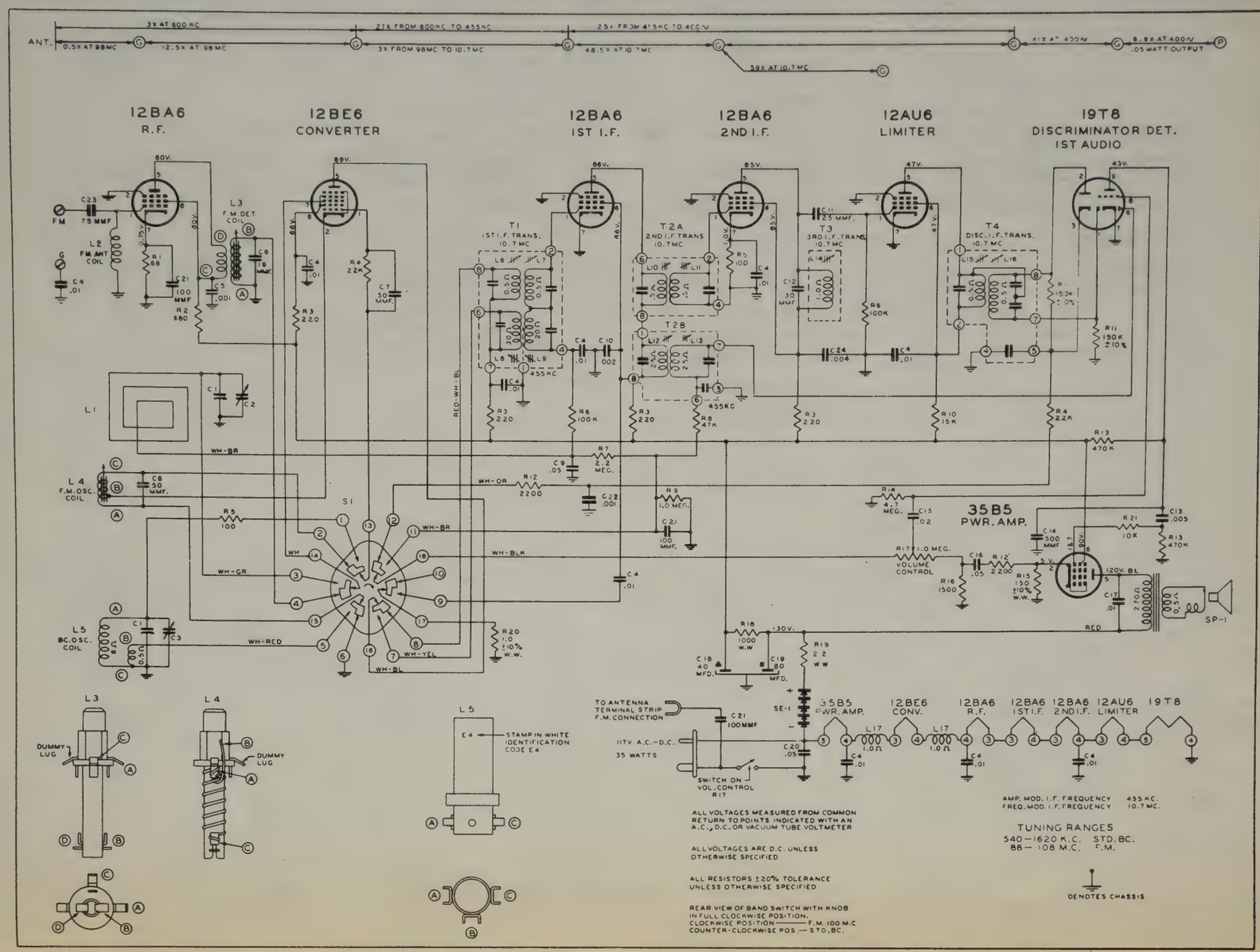

THIS SPRING ON REAR OF LARGE PULLEY
THIS SPRING ON FRONT OF SMALL PULLEY
1 1/2 TURNS
3/8 TURN
1 TURN
1 1/8 TURN
2 TURNS
DIAL CORD DRIVE SHOWN IN FULL COUNTER-CLOCKWISE POSITION.

DIAL CABLE DRAWING AND DETAIL OF I. F. TRANSFORMER

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3, 4, 5, 6	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

MODEL G723
CHASSIS 7G04



PARTS LIST

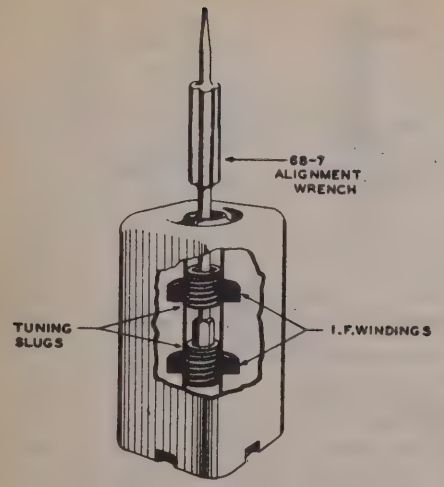
PART NO.	DESCRIPTION	PRICE
	DIAL ASSEMBLY	
26-443	Dial Scale	1.50
46-859	Band Switch Knob	.15
46-860	Tuning & Volume Control Knob (2 used)	.15
59-243	Dial Pointer	.15
80-402	Dial Cord Tension Spring	.03
80-444	Tuner Arm Tension Spring	.05
80-580	Tuner Arm Stop Spring	.06
80-817	Tuner Spring	.06
80-818	Tuner Arm Pressure Spring	.12
93-910	Felt Washer - Brown (2 used on 46-860 & 1 used on 46-859)	.01
93-956	1/16" x 9/32" x 3/4" Black Felt Washer (Used on 59-243)	.01
188-32	Retaining Ring (Used on S-16885)	1.03C
199-35	Dial Scale Spacer Sleeve	.05
S-14523	Tuning Shaft Brkt. & Insulating Strip Assem.	.20
S-14524	Condenser Pulley & Cam Assembly	.55
S-14525	Tuner Arm Assembly	.75
S-16885	Tuning Shaft & Pulley Assembly	.30
S-16888	Dial Cord & Eyelet Assembly	.05
	COILS & CHOKES	
95-1102	2nd. I. F. Transformer	1.60
95-1150	2nd. I. F. Transformer	1.50
95-1153	Discriminator Transformer	1.50
S-13871	F. M. Detector Coil Assembly	.75
S-13997	Filament Choke Assembly (2 used)	.40
S-14481	Broadcast Osc. Coil Assembly	.75
S-14509	3rd. I. F. Coil Assembly	2.50
S-14521	1st. I. F. Transformer Assembly	2.50
S-14695	F. M. Osc. Coil Assembly	.60
S-15690	F. M. Antenna Coil Assembly	.25
	CONDENSERS	
22-3	.01 Mfd. Ceramic (10 used) 500V	.26
22-229	.005 " 600V	.20
22-448	.004 " 600V	.20
22-829	.05 " 200V	.20
22-830	.02 " 600V	.20
22-854	500 Mmfd. 600V	.20
22-887	.001 Mfd. 600V	.20
22-1017	.05 " 400V	.20

PART NO.	DESCRIPTION	PRICE
	CONDENSERS Cont'd.	
22-1126	.01 " 400V	.20
22-1158	.05 " 200V	.20
22-1220	.002 " 600V	.20
22-1492	50 Mmfd. Ceramic 500V	.27
22-1507	25 " " 500V	.33
22-1511	50 " " 500V	.33
22-1669	100 " "(or 22-5) (3 used) 500V	.20
22-1676	.001 Mfd. Ceramic 500V	.40
22-1688	19 Mmfd. " 500V	.30
22-1742	Two Section Variable	3.00
22-1757	Elect. Cond. 80-40 Mfd. - 150V	2.50
22-1768	30 Mmfd. Ceramic 500V	.20
22-1852	7.5 " " 500V	.35
	RESISTORS	
63-686	150 Ohm W.W. 1/2W 10% Ins. Res.	.21
63-1223	1.0 " W.W. " " " "	.21
63-1450	22 " W.W. 1W 20% " "	.24
63-1527	1000 " W.W. 3W " " "	.39
63-1737	68 " 1/2W " " "	.21
63-1744	100 " " " " "(2 used)	.21
63-1758	220 " " " " "(4 used)	.21
63-1779	680 " " " " "	.21
63-1793	1500 " " " " "	.21
63-1800	2200 " " " " "(2 used)	.21
63-1828	10K " " " " "	.21
63-1835	15K " " " " "	.21
63-1842	22K " " " " "(2 used)	.21
63-1856	47K " " " " "	.21
63-1870	100K " " " " "(2 used)	.21
63-1876	150K " " 10% " "(2 used)	.21
63-1898	470K " " 20% " "(2 used)	.21
63-1912	1 Megohm " " " "	.21
63-1926	2.2 " " " " "	.21
63-1940	4.7 " " " " "	.21
63-2113	Volume Control & Switch	1.81
	MISCELLANEOUS	
12-1070	Wavemagnet Mounting Bracket	.25
14-1232	Plastic Cabinet for G723	5.50
49-667	4" P.M. Speaker	6.00
	208-667 Cone & Voice Coil	1.73
	206-667 Output Transformer	1.67

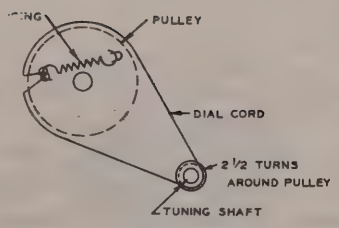
PART NO.	DESCRIPTION	PRICE
	MISCELLANEOUS Cont'd.	
54-139	3/8-32 x 9/16" Palnut (1 ea. used 85-481 & 63-2113)	.01
54-226	Speed Nut Tinnerman (1 ea. used S-13871 & S-14695)	.01
54-267	#6-32 x 5/16" Palnut (Used on 26-443)	.45C
54-269	#8-32 x 11/32" Palnut Steel Cad. (Used on S-14521)	.01
54-271	6-32 x 1/4" Palnut (5 used on I.F's.)	.01
57-1269	I. F. Transformer Terminal Plate (2 used)	.06
57-1613	Cabinet Emblem Plate	.20
58-128	Two Prong Plug	.15
73-131	#6-32 x 3/8" Slab Hd. Set Screw Cuppoint (2 used on Gang)	.03
78-788	Miniature Tube Socket	.35
78-806	Miniature Tube Socket	.15
78-807	Miniature Tube Socket (5 used)	.15
83-1056	Wavemagnet Mounting Strip	.03
83-1090	Insulating Strip	.02
83-1520	Rectifier Insulating Strip	.03
83-1736	Felt Strip (2 used)	.01
83-1773	Insulating Strip (3 hole strip over controls)	.04
85-481	Band Switch	1.60
93-35	.032 x .144 x 3/8" Steel Washer N.P. (2 used on 26-443 & 49-667)	.25C
94-613	Iron Core Insulating Bushing (2 used)	.06
97-293	Chassis Mounting Stud (2 used)	.18
112-281	#10 x 3/4" Oval Bind Hd. S.T. Stat. Bronze (2 used on Chassis Mtg.)	1.20C
114-293	#6-32 x 3/8" Hex Hd. Sl. M.S. Steel (3 used)	.02
114-340	#6 x 1-1/8" Hex Hd. Sl. S.T. (used on 212-7)	.03
139-79	Speaker Baffle	.05
149-64	Iron Core & Spring (2 used)	.40
149-65	Iron Core & Screw	.10
159-50	Cinch Plug Button Black Ox. (4 used on 192-117)	.01
159-69	Plug Button Stat. Bronze (4 used on S-14549)	.01
192-117	Dial Glass	.75
196-111	Speaker Gasket	.55
202-697	F. M. Instruction Book	.10
202-808	Instruction Book	.06
212-7	Selenium Rectifier	1.80
S-14527	Wavemagnet Lead & Stop Assembly	.20
S-14549	Cabinet Back Assembly (Complete)	1.75
S-14957	Wavemagnet Assembly	1.25
S-15739	Speaker Support Bracket & Plate Assembly	.20

Prices shown are suggested list prices and are subject to change without notice.

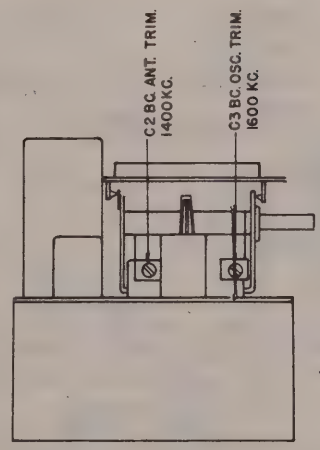
TUBE AND TRIMMER LOCATION

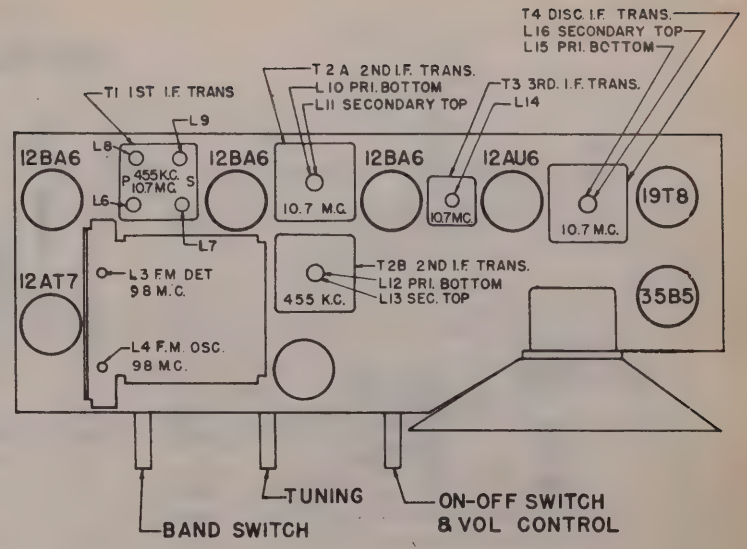


Detail of
IF Transformer



DIAL CORD DRIVE





ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6-Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

CHASSIS 7G02

TO THE SERVICE MAN:

The 7G02 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7G02 or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

FM-AM 1st IF Alignment: The alignment of the 1st IF transformer is conventional. The alignment slugs are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible. The 2nd AM and FM IF transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.

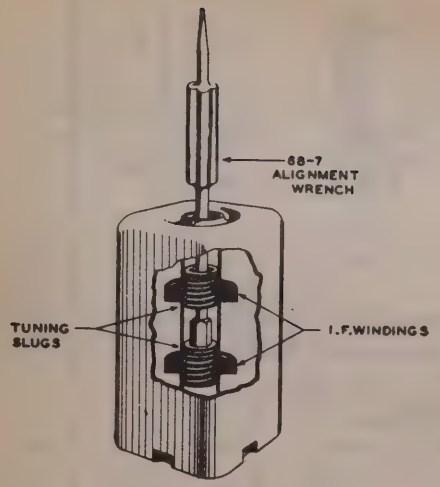
PARTS LIST CONT'D

93-729		032 X .187 X 5/8" Steel Washer (Used on 26-442)	.55C
94-613		Iron Core Insulating Bushing (2 Used)	.06
97-293		Chassis Mtg. Stud (2 Used)	.18
112-281		#10 X 3/4" Oval Binding Hd. S.T. Screw Type Z Stat. Br. (2 Used Chassis Mtg.)	1.20C
114-340		#6 X 1-1/2" Hex Hd. Sl. S.T. (Used on 212-7)	.03
126-618		Tube Shield	.02
149-64		Iron Core & Spring (2 Used)	.40
149-65		Iron Core & Screw	.10
159-50		Plug Button - Stat. Bronze (4 Used on 192-117)	.01
159-69		Plug Button - Stat. Bronze (4 Used on S-14549)	.01
192-117		Dial Glass	.75
196-111		Speaker Gasket	.55
199-103		Flexible Handle Sleeve	.35
202-697		F.M. Instruction Book	.10
202-809		Instruction Book	.06
212-7	SE-1	Selenium Rectifier	1.80
S-13210		Strip & Rivet Assem. (Handle)	.20
S-14527		Wavemagnet Lead & Stop Assem.	.20
S-14549		Cabinet Back Assem. (Complete)	1.75
S-14957	L1	Wavemagnet Assem.	1.25

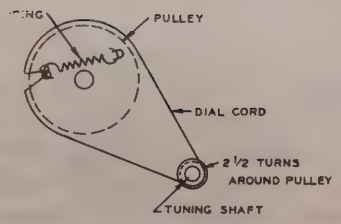
Prices shown are suggested list prices and are subject to change without notice.

ZENITH RADIO CORPORATION 1/12/50

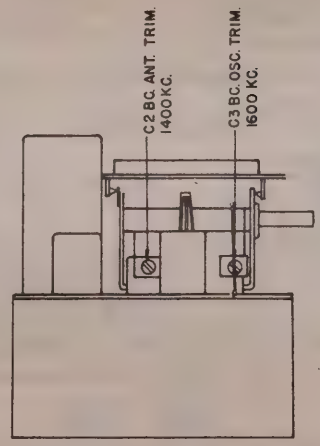
TUBE AND TRIMMER LOCATION

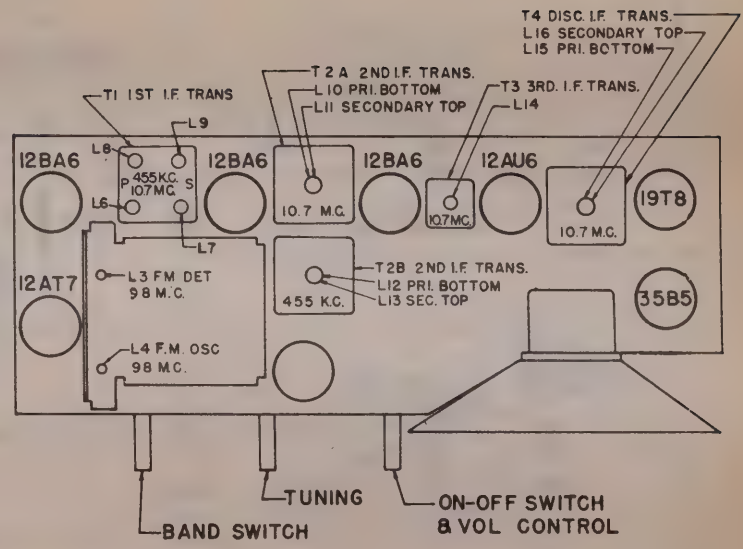


Detail of
IF Transformer



DIAL CORD DRIVE

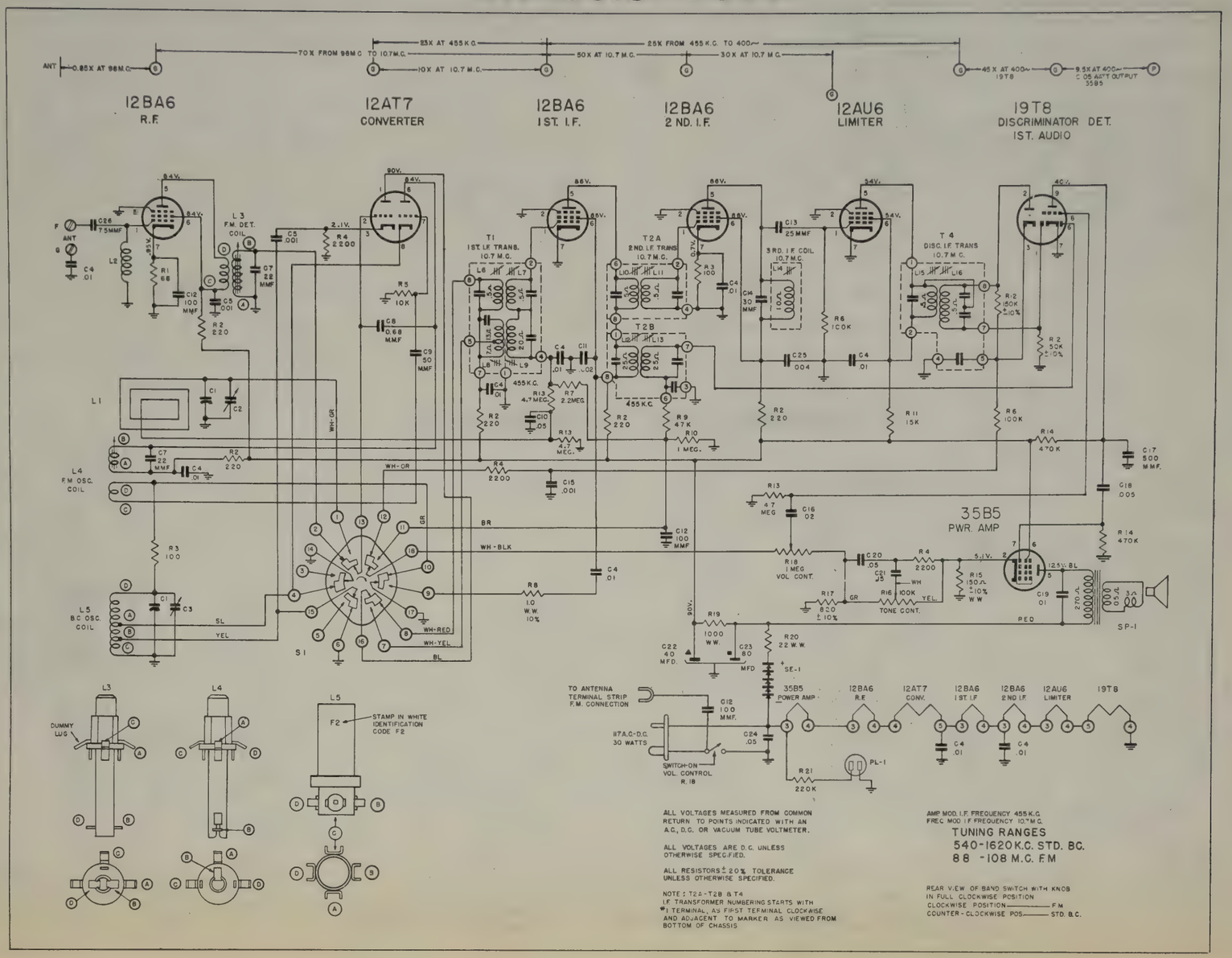




ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

MODEL G724
CHASSIS 7G02



PARTS LIST

DIAL ASSEMBLY

12-1546		Indicator Socket Brkt.	.02
26-442		Dial Scale	2.80
46-780		Tone Control Knob	.10
46-811		Tuning & Vol. Control Knob (2 Used)	.40
46-844		Band Switch Knob	.45
59-243		Dial Pointer	.15
78-585		Indicator Socket	.20
80-402		Dial Cord Tension Spring	.03
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-817		Tuner Spring	.06
80-818		Tuner Arm Pressure Spring	.12
93-774		Felt Washer - Brown (1 Used 46-844 & 2 Used 46-811)	.03
93-956		1/16 X 9/32 X 3/4" Black Felt Washer (Used on 59-243)	.01
100-105	PL-1	Neon Indicator Bulb	.11
114-51		#6-32 X 1/2" Hex Sl. Hd. M.S. Steel N.P. (1 ea. used on 12-1546 & 26-442)	.80C
188-32		Retaining Ring (Used on S-16885)	1.03C
199-35		Dial Scale Spacer Sleeve	.05
S-14523		Tuning Shaft Brkt. & Insulating Strip Assem.	.20
S-14524		Condenser Pulley & Cam Assem.	.55
S-14525		Tuner Arm Assem.	.75
S-16885		Tuning Shaft & Pulley Assem.	.30
S-16888		Dial Cord & Eyelet Assem.	.05

COILS & CHOKES

95-1102	T2B	2nd I.F. Trans. (Broadcast)	1.60
95-1150	T2A	2nd I.F. Trans. (F.M.)	1.50
95-1153	T4	Discriminator Trans.	1.50
S-13871	L3	F.M. Detector Coil Assem.	.75
S-14509	L14	3rd I.F. Coil Assem.	2.50
S-15690	L2	F.M. Antenna Coil Assem.	.25
S-15694	L5	Broadcast Osc. Coil Assem.	.65
S-15695	T1	1st. I.F. Trans. Assem.	3.00
S-15733	L4	F.M. Oscillator Coil Assem.	.55

CONDENSERS

22-3	C4	.01 Mfd. Ceramic (9 Used)	500V	.26
22-5	C12	110 Mmfd. Ceramic (3 Used) (Or 22-1669)	500V	.26
22-229	C18	.005 Mfd.	600V	.20
22-448	C25	.004 Mfd.	600V	.20
22-829	C10	.05 Mfd.	200V	.20
22-830	C16	.02 Mfd.	600V	.20
22-854	C17	500 Mmfd.	600V	.20
22-887	C15	.001 Mfd.	600V	.20
22-1017	C24	.05 Mfd.	400V	.20
22-1025	C21	.15 Mfd.	200V	.20
22-1126	C19	.01 Mfd.	400V	.20
22-1158	C20	.05 Mfd.	200V	.20
22-1220	C11	.002 Mfd.	600V	.20
22-1367	C9	50 Mmfd.	500V	.33
22-1506	C7	22 Mmfd. Ceramic (2 Used)	500V	.33
22-1507	C13	25 Mmfd. Ceramic	500V	.33
22-1676	C5	.001 Mfd. Ceramic (2 Used)	500V	.40
22-1752	C1	Two Section Variable		3.00
22-1757	C22-C23	Elect. Cond. 80-40 Mfd.	150V	2.50
22-1766	C8	.68 Mmfd. Ceramic	500V	.20
22-1768	C14	30 Mmfd. Ceramic	500V	.20
22-1852	C26	7.5 Mmfd. Ceramic	500V	.35

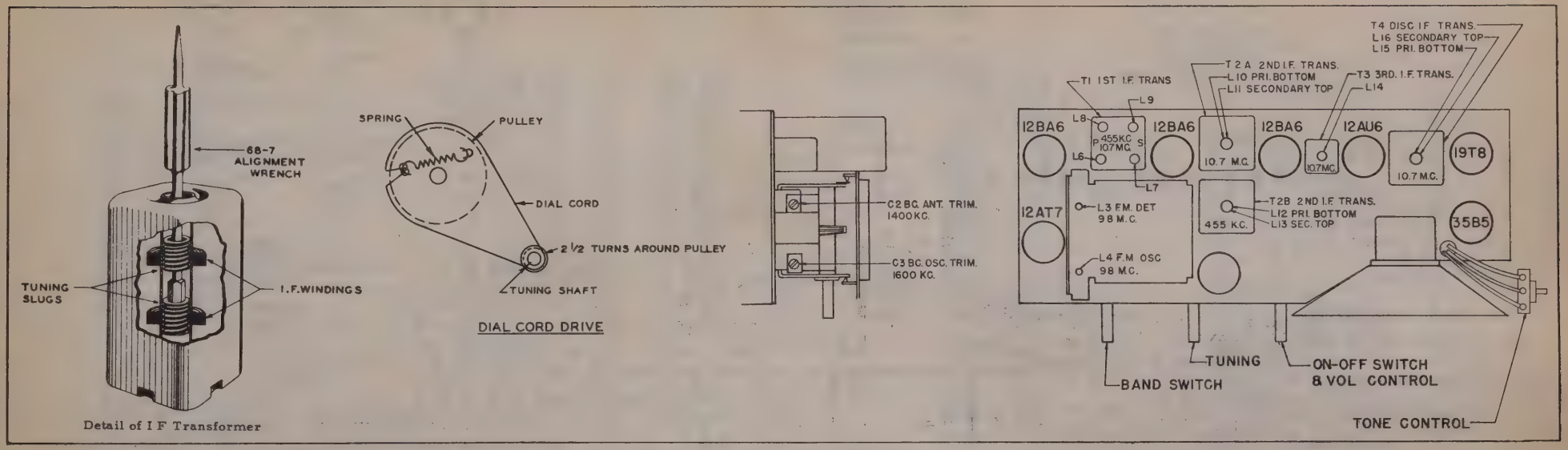
RESISTORS

63-686	R15	150 Ohm W.W. 1/2W 10% Ins. Res.	.21
63-1223	R8	1.0 Ohm W.W. 1/2W 10% Ins. Res.	.21
63-1450	R20	22 Ohm W.W. 1W 20% Ins. Res.	.24
63-1527	R19	1000 Ohm W.W. 3W 20% Ins. Res.	.39
63-1737	R1	68 Ohm 1/2W 20% Ins. Res.	.21
63-1744	R3	100 Ohm 1/2W 20% Ins. Res. (2 Used)	.21
63-1758	R2	220 Ohm 1/2W 20% Ins. Res. (5 Used)	.21
63-1782	R17	820 Ohm 1/2W 10% Ins. Res.	.21
63-1800	R4	2200 Ohm 1/2 20% Ins. Res. (3 Used	.21
63-1828	R5	10K Ohm 1/2W 20% Ins. Res.	.21
63-1835	R11	15K Ohm 1/2W 20% Ins. Res.	.21
63-1856	R9	47K Ohm 1/2W 20% Ins. Res.	.21
63-1870	R6	100K Ohm 1/2W 20% Ins. Res. (2 Used)	.21
63-1876	R12	150K Ohm 1/2W 10% Ins. Res. (2 Used)	.21
63-1884	R21	220K Ohm 1/2W 20% Ins. Res.	.21
63-1898	R14	470K Ohm 1/2W 20% Ins. Res. (2 Used)	.21
63-1912	R10	1 Megohm 1/2W 20% Ins. Res.	.21
63-1926	R7	2.2 Megohm 1/2W 20% Ins. Res.	.21
63-1940	R13	4.7 Megohm 1/2W 20% Ins. Res. (3 Used)	.21
63-2008	R16	Tone Control	1.20
63-2113	R18	Volume Control & Switch	1.81

MISCELLANEOUS

12-1070		Wavemagnet Mtg. Brkt.	.25
14-1233		Plastic Cabinet for G724	5.50
43-165		Handle Housing	1.00
49-634	SP-1	5-1/4" P.M. Speaker	8.25
		208-634 Cone & Voice Coil	1.73
		206-634 Output Trans.	1.97
54-139		3/8-32 X 9/16" Palnut (1 Ea. Used on 63-2113 & 85-481)	.01
54-226		Speed Nut (1 Ea. Used on S-13871 & S-15733)	.01
54-267		#6-32 X 5/16" Palnut - Steel Cad. (7 Used)	.45C
54-269		#8-32 X 11/32" Palnut - Steel Cad. (Used on S-15695)	.01
54-305		3/8-32 X 9/16 Palnut - Steel Stat. Bronze	.01
57-1269		I.F. Trans. Terminal Plate (2 Used)	.06
57-1613		Cabinet Emblem Plate	.20
58-128		Two Prong Plug	.15
73-131		#6-32 X 3/8" Slab. Hd. Set Screw (2 Used on Gang)	.03
78-806		Miniature Tube Socket	.15
78-807		Miniature Tube Socket (4 Used)	.15
78-850		Miniature Tube Socket (9 Contact)	.35
78-868		Miniature Tube Socket (9 Contact)	.25
83-1056		Wavemagnet Mtg. Strip	.03
83-1090		Insulating Strip	.02
83-1393		Rubber Strip (Handle)	.30
83-1520		Rectifier Insulating Strip	.03
83-1736		Felt Strip (2 Used)	.01
83-1773		Insulating Strip (3 Hole Strip over Controls)	.04
85-481	S-1	Band Switch	1.60
93-35		.032 X .144 X 3/8 Steel Washer (2 Used on 26-442)	.25C
93-125		#6 Int. Shakeproof Lockwasher (5 Used on Gang)	.31C
93-487		1/16 X .144 X 3/8" Steel Washer (2 Used on 43-165)	.01
93-719		031 X 3/16 X 7/16" Steel Washer (Used on 26-442)	.01

TUBE AND TRIMMER LOCATION



ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I.F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd. IF transformer	Align 2nd IF transformer for maximum reading
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st. IF transformer	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum

TO THE SERVICE MAN:

The 7G01 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

When adjustments are made on the 7G01 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustments will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

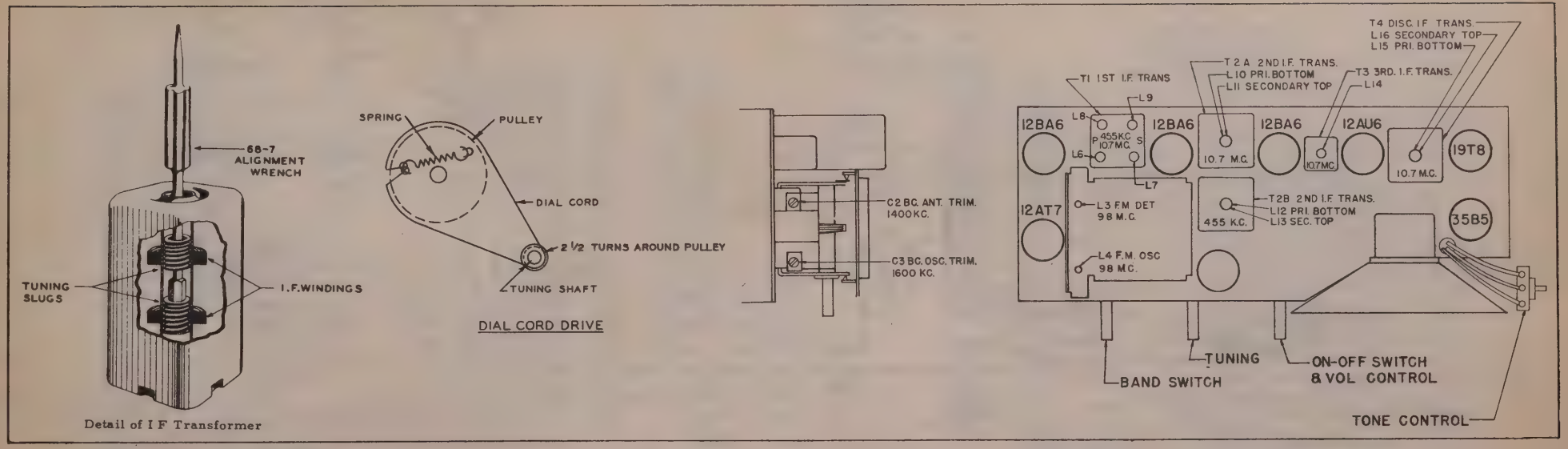
409

PARTS LIST

83-1056		Wavemagnet Mtg. Strip (2 Used)	.03
83-1519		Aluminum Foil Strip	.03
*83-1755		Aluminum Foil Strip	.10
*83-1756		Indicator Strip	.05
85-464	S1	Band Switch	3.00
93-665		Fibre Washer (2 Used on S-14385)	.01
93-729		.032 X .187 X 5/8 Steel Washer N.P. (2 Used on S-13981)	.55C
94-334		Speaker Mtg. Bushing (4 Used)	.67C
94-485		Fibre Bushing (1 ea. used on 63-1584 & 63-2108)	.03
95-1035	T5	Output Trans.	2.65**
97-284		Dial Cord Guide Stud	.17
97-293		Insulating Stud (4 Used)	.18
112-281		#10 X 3/4" Oval B.H.S.T. Screw-Type Z - Stat. Bronze (4 Used Chassis Mtg.)	1.20C
112-697		#6 X 7/16" Straight Side B.H.S.T. Screw (4 Used on Back)	.02
114-26		#8 X 1/4" Hex Hd. S.T. (2 Used on S-13977)	.55C
114-78		#8 X 5/16" Hex Hd. S1. S.T. N.P. (2 Used Wavemagnet Mtg)	1.40C
114-292		#6 X 5/8" Hex Hd. S1. S.T. Screw (8 Used)	.01
114-319		#8-32 X 11/16" Hex Hd. S1. M.S. Steel (2 Used on S-13981)	.02
125-17		Rubber Grommet (4 Used on 49-608)	.03
125-62		Rubber Grommet (4 Used)	.02
*139-88		Baffle Board	.15
149-64		Tuning Core (3 Used)	.40
188-34		Retaining Ring	1.20C
*188-136		Trim Ring	.20
202-697		F.M. Instruction Book	.10
*202-810		Instruction Book	.08
212-7	SE-1	Selenium Rectifier	1.80
S-13977	L1	Wavemagnet Assem.	1.25
S-14128		Cabt. Back Assem. (Complete)	1.75
S-14358		Wavemagnet Cable Assem.	.20

Prices shown are suggested list prices and are subject to change without notice.

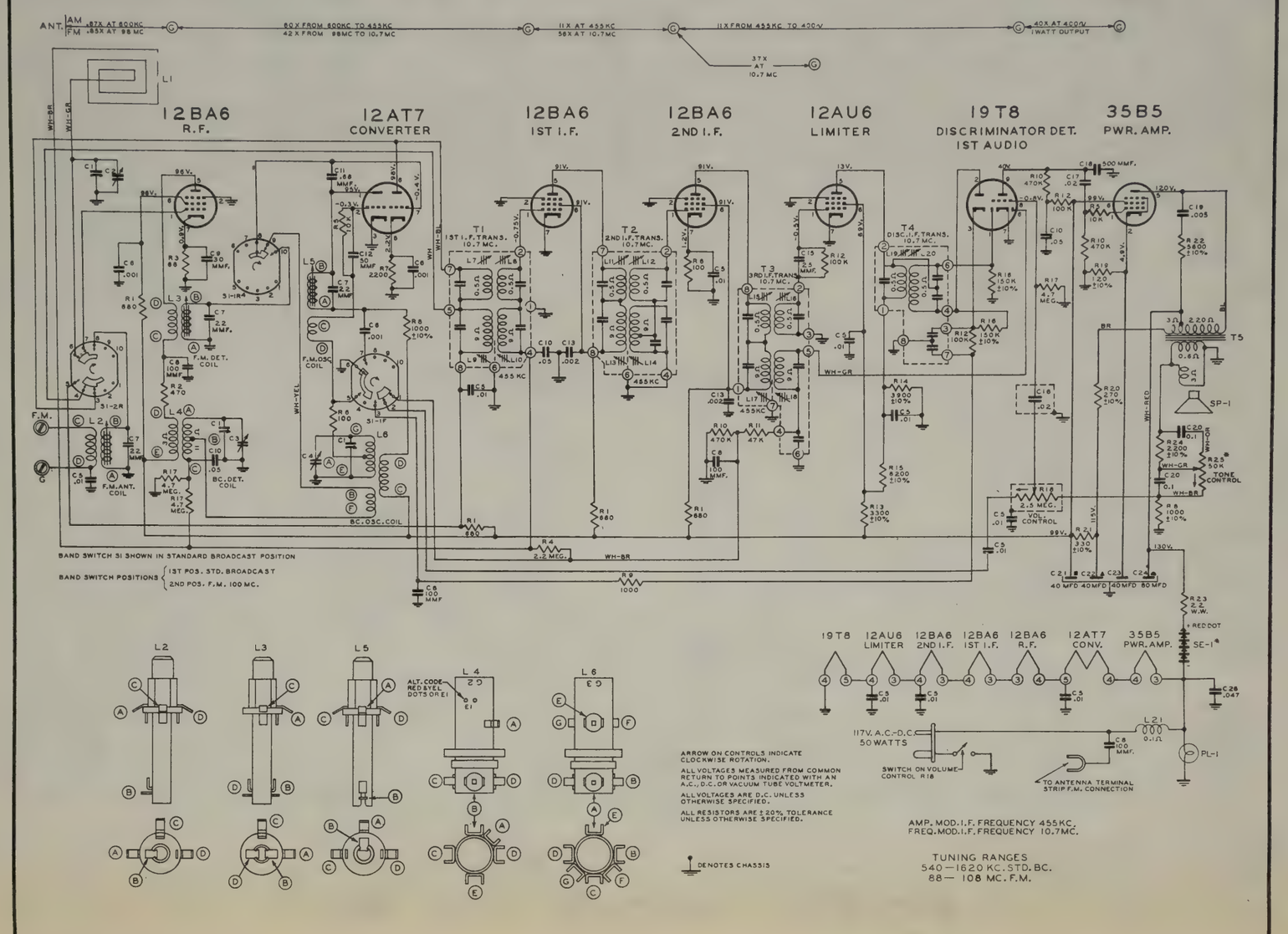
TUBE AND TRIMMER LOCATION



ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I.F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L14 Prim. of 3rd IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 and L11 Prim. and Sec. of 2nd. IF transformer	Align 2nd IF transformer for maximum reading
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st. IF transformer	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum

MODEL G725
CHASSIS 7G01


ANT.
AM .87X AT 600KC
FM .85X AT 98 MC
80X FROM 600KC TO 455KC
42X FROM 98MC TO 10.7MC
11X AT 455KC
58X AT 10.7MC
11X FROM 455KC TO 400V
40X AT 400V
1 WATT OUTPUT
37X AT 10.7 MC
12BA6 R.F.
12AT7 CONVERTER
12BA6 1ST I.F.
12BA6 2ND I.F.
12AU6 LIMITER
19T8 DISCRIMINATOR DET. 1ST AUDIO
35B5 PWR. AMP.
T1 1ST I.F. TRANS. 10.7 MC.
T2 2ND I.F. TRANS. 10.7MC.
T3 3RD I.F. TRANS. 10.7 MC.
T4 DISC. I.F. TRANS. 10.7MC.
T5
SP-1
F.M. DET. COIL
F.M. ANT. COIL
BC. DET. COIL
F.M. OSC. COIL
BC. OSC. COIL
455 KC
VOL. CONTROL
TONE CONTROL
SE-1
PL-1
117V. A.C.-D.C. 50 WATTS
SWITCH ON VOLUME CONTROL R18
TO ANTENNA TERMINAL STRIP F.M. CONNECTION
BAND SWITCH S1 SHOWN IN STANDARD BROADCAST POSITION
BAND SWITCH POSITIONS
1ST POS. STD. BROADCAST
2ND POS. F.M. 100 MC.
ALT. CODE RED & YEL DOTS OR E1
ARROW ON CONTROLS INDICATE CLOCKWISE ROTATION.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
AMP. MOD. I.F. FREQUENCY 455KC.
FREQ. MOD. I.F. FREQUENCY 10.7MC.
TUNING RANGES
540—1620 KC. STD. BC.
88—108 MC. F.M.

PARTS LIST

DIAL ASSEMBLY

12-1407		Dial Light Socket Mtg. Brkt.	.03
*26-445		Dial Scale	3.90
46-538		Tuning Control Knob	.10
46-718		Band Switch Knob	.15
*46-855		Tone Control Knob	.10
57-1613		Cabinet Emblem Plate	.20
57-1615		Dial Scale Clamping Plate (4 Used)	.01
*57-1641		Name Plate	.35
*59-245		Dial Pointer	.70
78-786		Dial Light Socket	.60
80-69		Dial Cord Spring	.05
80-209		Dial Cord Spring	.03
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-581		Tuner Arm Pressure Spring	.10
93-475		Felt Washer (Part of S-14124)	1.81C
94-613		Iron Core Insulating Bushing (3 Used on S-14429)	.06
100-97	PL-1	Dial Light Bulb - 115V	.25**
114-26		#8-32 X 1/4" Hex. Hd. Sl. M.S. (Used on 12-1407)	.55C
188-30		Retaining Ring (Used on 76-493)	1.20C
188-102		Clamping Ring (46-538)	.02
S-13983		Dial Cord & Eyelet Assem.	.06
S-13945		Cam, Pulley & Bushing Assem.	.55
S-13981		Tone Control Brkt. & Lug Assem.	.25
S-14129		Vol. Control Knob Assem.	.30
S-14429		Tuner Arm Assem.	.80
*S-16735		Pointer Pulley & Bushing Assem.	.25
*S-16884		Pulley & Shaft Assem.	.25
*S-16887		Dial Cord & Eyelet Assem.	.05

COILS & CHOKES

S-12256	L21	A.C. Line Choke Coil Assem.	.35
S-13971	T2	2nd I.F. Trans. Assem.	2.75
S-13972	T3	3rd I.F. Trans. Assem.	3.00
S-13973	T4	Discriminator Trans. Assem.	2.00
S-14192	L2	F.M. Antenna Coil Assem.	.70
S-15733	L5	F.M. Oscillator Coil Assem.	.55
S-15743	L3	F.M. Detector Coil Assem.	.65
S-15981	T1	1st. I.F. Trans. Assem.	2.50
S-16344	L4	Broadcast Detector Coil Assem.	.60
S-16345	L6	Broadcast Osc. Coil Assem.	.60

CONDENSERS

22-3	C5	.01 Mfd. Ceramic (Disc.) (10 Used)	500V	.26
22-5	C8	110 Mfd. Ceramic (Disc.) (4 Used)	500V or 22-1669	.26
22-829	C10	.05 Mfd. (3 Used)	200V	.20
22-830	C17	.02 Mfd.	600V	.20
22-854	C18	.0005 Mfd.	600V	.20
22-1220	C13	.002 Mfd. (2 Used)	600V	.20
22-1367	C12	50 Mmfd. Ceramic	500V	.33
22-1506	C7	22 Mmfd. Ceramic (3 Used)	500V	.33
22-1507	C15	25 Mmfd. Ceramic	500V	.33
22-1661	C21, C22, C23, C24	Elect. Cond. 80-40-40 Mfd.-150V 40 Mfd.	25V	3.00
22-1676	C6	.001 Mfd. (3 Used)	500V	.40
22-1677	C1	Three Gang Variable Cond.		4.35
22-1683	C16	.02 Mfd. (Shielded)	400V	.40
22-1702	C19	.005 Mfd.	400V	.20
22-1705	C9	30 Mmfd. Ceramic	500V	.20
22-1766	C11	.68 Mmfd. (Molded)	500V	.20
22-1775	C26	.047 Mfd.	400V	.26
22-2084	C20	.1 Mfd. (2 Used)	200V	.26

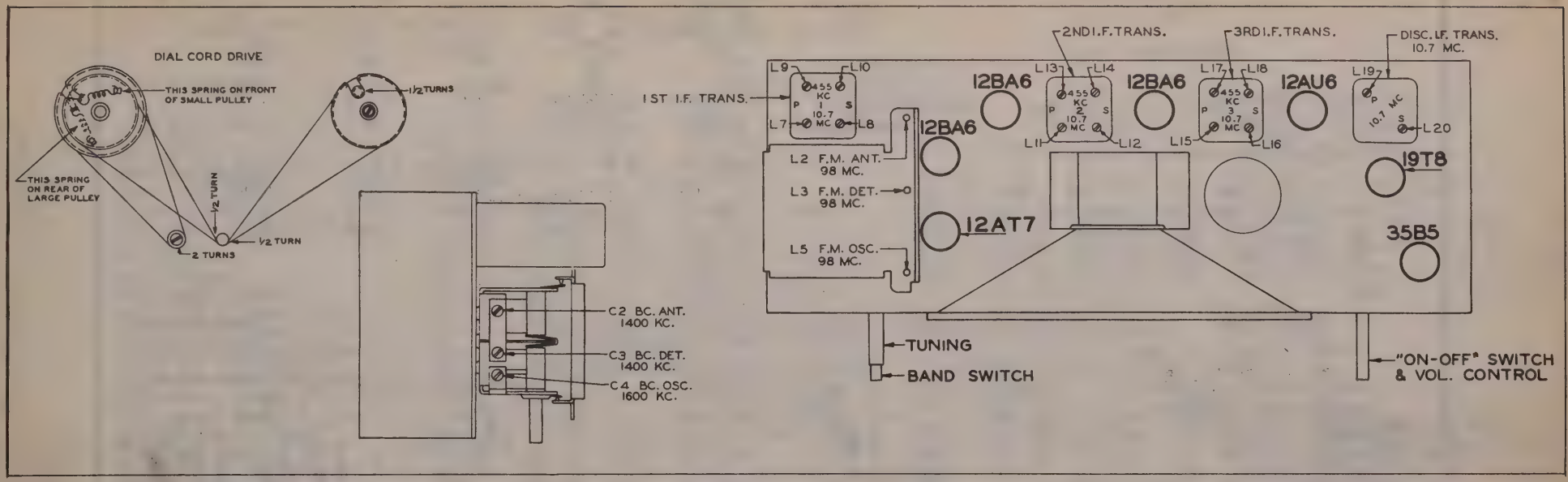
RESISTORS

63-1202	R21	330 Ohm W.W. 2W 10% Ins. Res.	.36
63-1450	R23	22 Ohm W.W. 1W 20% Ins. Res.	.24
63-1452	R20	270 Ohm W.W. 2W 10% Ins. Res.	.33
63-1584	R18	Volume Control & Switch	1.81
63-1737	R3	68 Ohm 1/2W 20% Ins. Res.	.21
63-1744	R6	100 Ohm 1/2W 20% Ins. Res. (2 Used)	.21
63-1747	R19	120 Ohm 1/2W 10% Ins. Res.	.21
63-1772	R2	470 Ohm 1/2W 20% Ins. Res.	.21
63-1779	R1	680 Ohm 1/2W 20% Ins. Res. (4 Used)	.21
63-1785	R8	1000 Ohm 1/2W 10% Ins. Res. (2 Used)	.21
63-1786	R9	1000 Ohm 1/2W 20% Ins. Res.	.21
63-1799	R24	2200 Ohm 1/2W 10% Ins. Res.	.21
63-1800	R7	2200 Ohm 1/2W 20% Ins. Res.	.21
63-1806	R13	3300 Ohm 1/2W 10% Ins. Res.	.21
63-1810	R14	3900 Ohm 1/2W 10% Ins. Res.	.21
63-1817	R22	5600 Ohm 1/2W 10% Ins. Res.	.21
63-1824	R15	8200 Ohm 1/2W 10% Ins. Res.	.21
63-1828	R5	10K Ohm 1/2W 20% Ins. Res. (2 Used)	.21
63-1856	R11	47K Ohm 1/2W 20% Ins. Res.	.21
63-1870	R12	100K Ohm 1/2W 20% Ins. Res. (3 Used)	.21
63-1876	R16	150K Ohm 1/2W 10% Ins. Res. (2 Used)	.21
63-1898	R10	470K Ohm 1/2W 20% Ins. Res. (3 Used)	.21
63-1926	R4	2.2 Megohm 1/2W 20% Ins. Res.	.21
63-1940	R17	4.7 Megohm 1/2W 20% Ins. Res. (3 Used)	.21
*63-2108	R25	Tone Control	1.20

MISCELLANEOUS

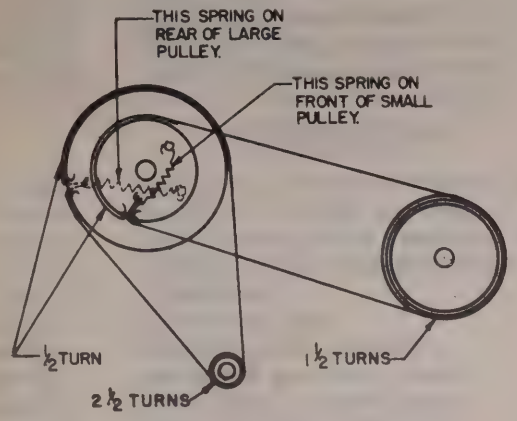
12-1070		Wavemagnet Mtg. Brkt. (2 Used)	.25
*14-1235		Plastic Cabinet for G725	7.25
19-139		Cabinet Back Retaining Clip (4 Used)	.03
49-608	SP-1	7-1/2" P.M. Speaker 208-608 Cone & Voice Coil	8.75 2.63
54-139		#3/8-32 x 9/16" Palnut Type 9N Steel Cad. (Used on 63-1584)	.01
54-140		#3/8-32 x 9/16" Hex Nut-Steel N.P. (Used on 63-2108)	.03
54-226		Speed Nut-Tinnerman (1 ea. used on S-14192-S-15733 & S-15743)	.01
54-269		#8-32 x 11/32" Palnut (6 Used to Mt. I.F.'s.)	.01
57-1269		I. F. Trans. Terminal Plate (8 Used)	.06
58-128		Two Prong Plug	.15
*74-64		Grill Screen	.70
78-782		Miniature Tube Socket (7 Contact)	.25
78-787		Two Contact Socket (Used on S-14128)	.10
78-788		Miniature Tube Socket (9 Contact)	.35
78-794		Miniature Tube Socket (3 Used)	.20
78-795		Miniature Tube Socket (7 Contact)	.20
78-854		Miniature Tube Socket (9 Contact)	.35

TUBE AND TRIMMER LOCATION

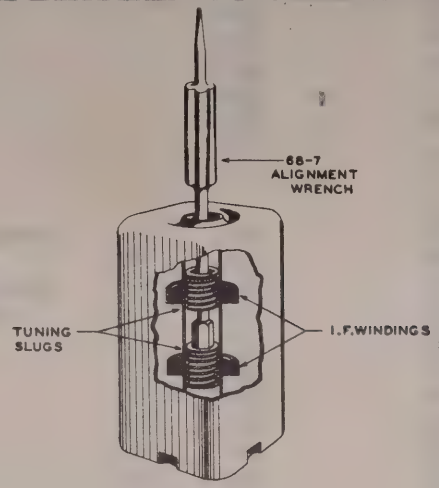


ALIGNMENT PROCEDURE

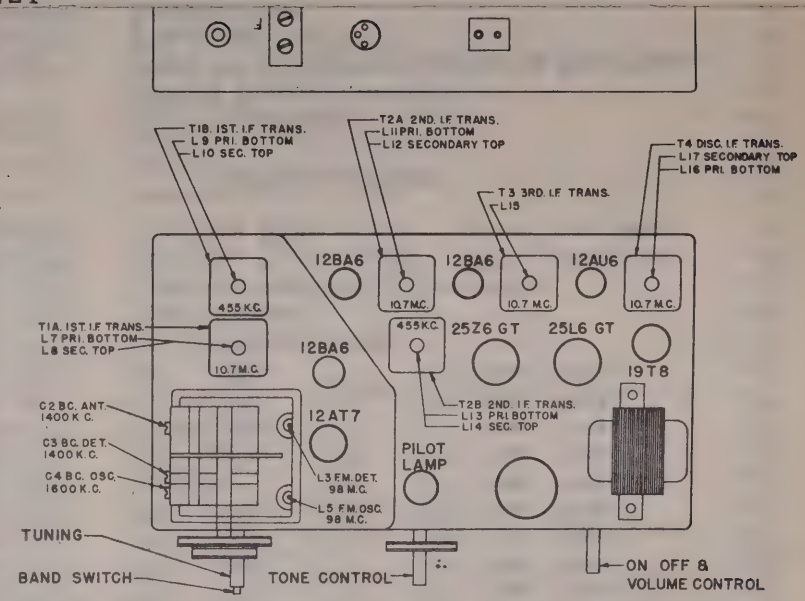
Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12AT7 Converter	.05 Mfd.	455 KC Modulated	BC	600 Kc	L-9, 10, 13, 14, 17 and 18	Align I.F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc	C4	Set oscillator to dial scale
3	2 turns loosely cpld. to wavemagnet		1400 Kc Modulated	BC	1400 Kc	C3 and C2	Align det. and ant. stages
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L19 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L20 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 and L16 Prim. and Sec. of 3rd IF transformer	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st, IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer	Align 2nd. IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st IF transformer	Align 1st. IF Transformer for maximum reading.
9 (c)(d)	Antenna Post F (Re-	270 ohms	98 Mc Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug	Set Oscillator to dial scale
			98 Mc.	FM		L3 and L2 Det.	Align det. and ant. stages to



DIAL CORD DRIVE



Detail of IF Transformer



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 8G21 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all bands.

When adjustments are made on the 8G21 chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

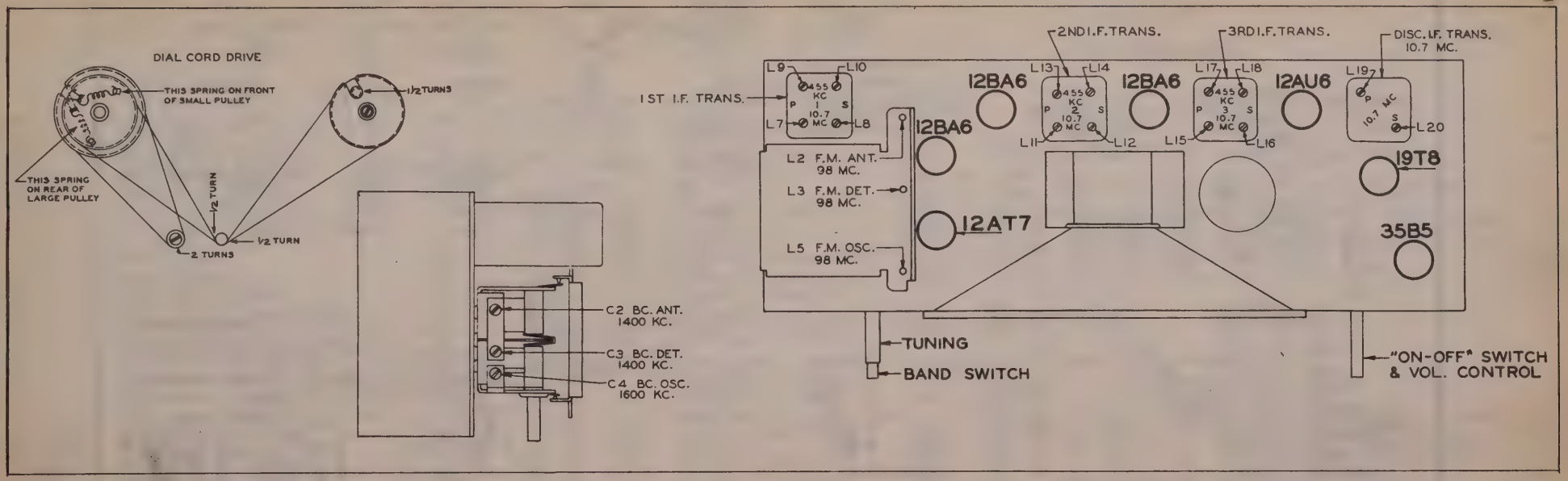
FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM And FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I F transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I F transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

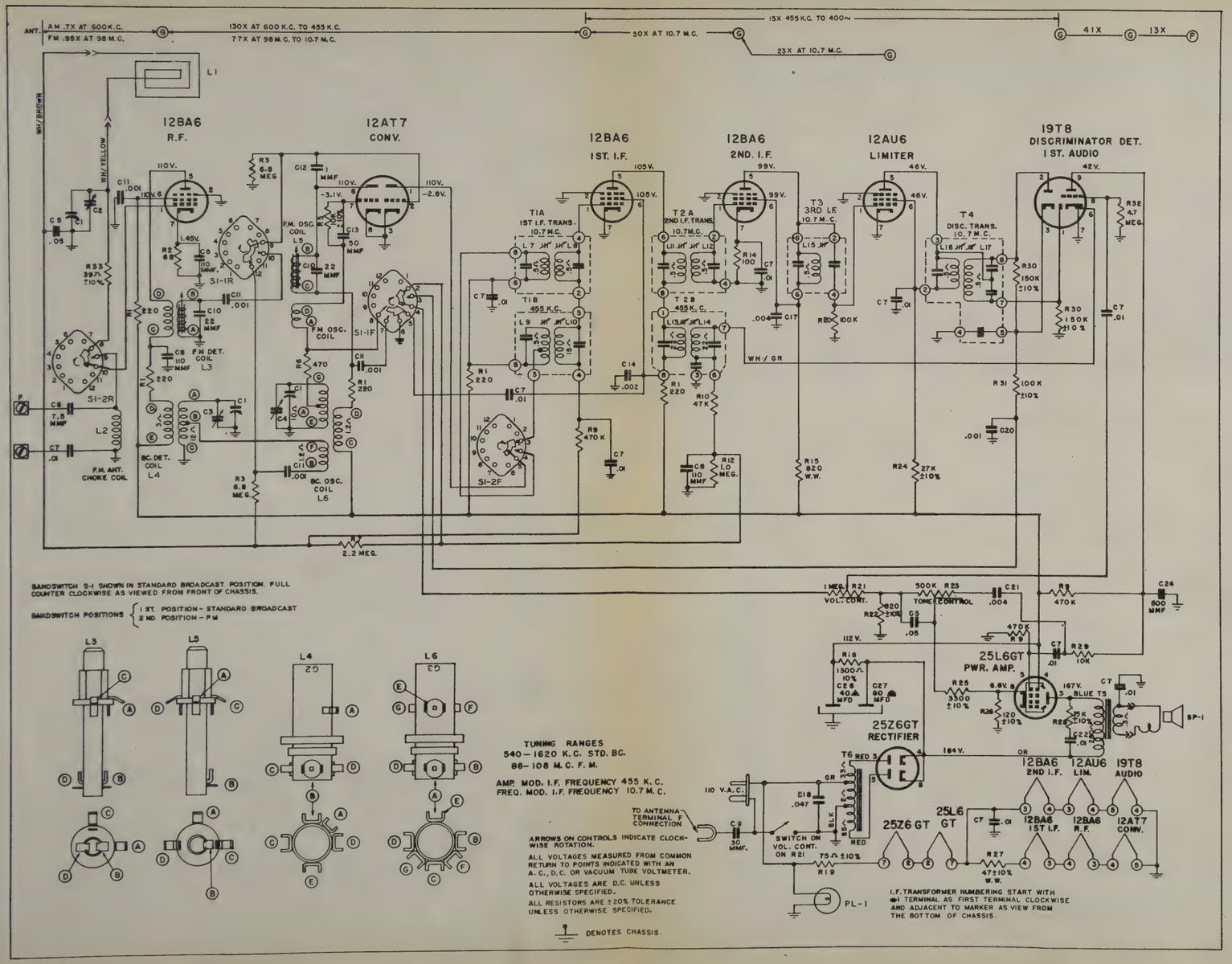
FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left(negative) of zero will give the same results.

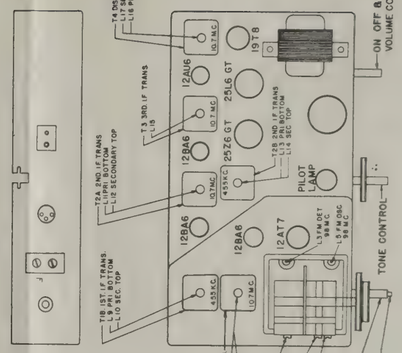
TUBE AND TRIMMER LOCATION

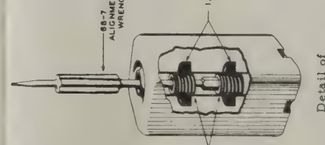


ALIGNMENT PROCEDURE

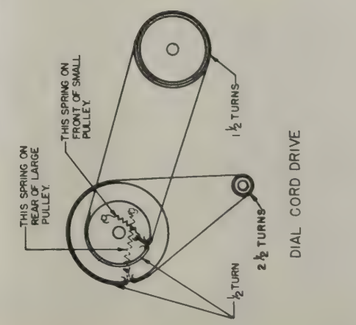
Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12AT7 Converter	.05 Mfd.	455 KC Modulated	BC	600 Kc	L-9, 10, 13, 14, 17 and 18	Align I.F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc	C4	Set oscillator to dial scale
3	2 turns loosely cpld. to wavemagnet		1400 Kc Modulated	BC	1400 Kc	C3 and C2	Align det. and ant. stages
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L19 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L20 coil slug sec. of discr.	Adjust secondary of discriminat-or for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 and L16 Prim. and Sec. of 3rd IF transformer	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st, IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer	Align 2nd. IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st IF transformer	Align 1st. IF Transformer for maximum reading.
9 (c)(d)		270 ohms	98 Mc Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug	Set Oscillator to dial scale
	Antenna Post F (Re-		98 Mc.	FM		L3 and L2 Det.	Align det. and ant. stages to







Detail of IF Transformer



DIAL CORD DRIVE

TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 8G21 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all bands.

When adjustments are made on the 8G21 chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM And FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I F transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I F transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 13, 14	Align I F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 Prim. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

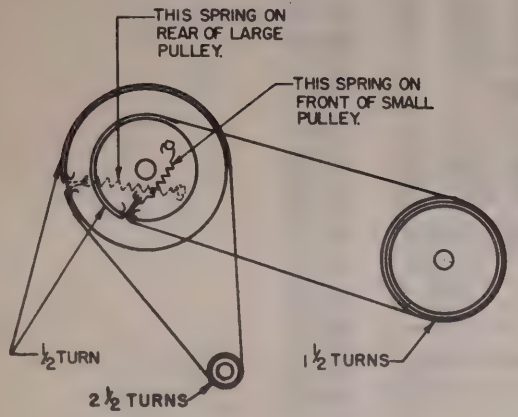
The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

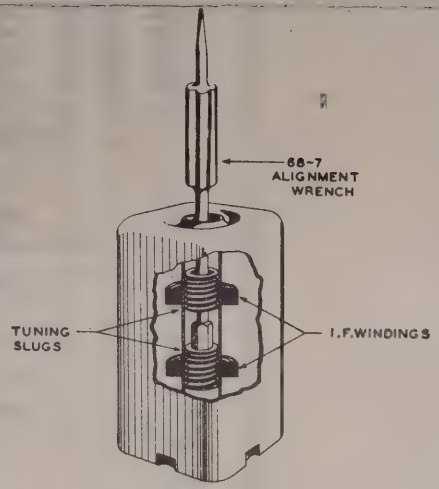
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

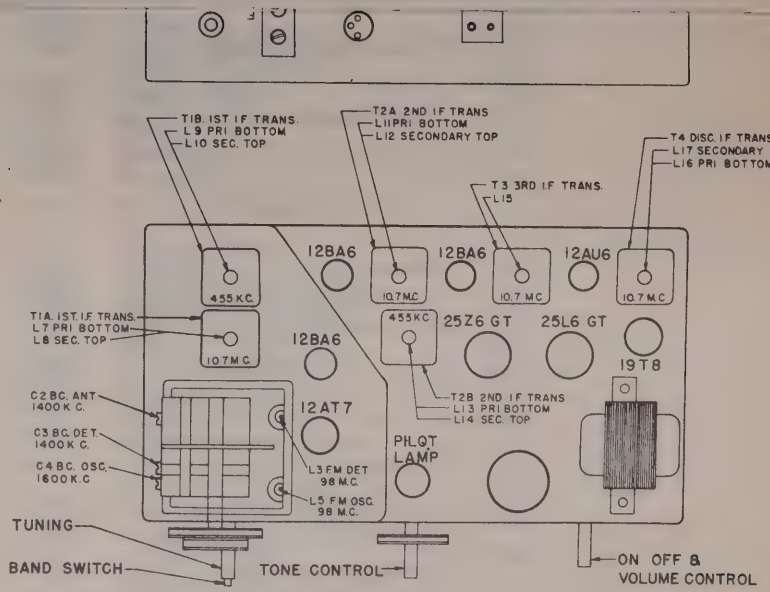
(d) Loosen Slugs by applying a hot iron to the cement.



DIAL CORD DRIVE



Detail of IF Transformer



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 8G20 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all Bands.

When adjustments are made on the 8G20 chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM And FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I F transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I F transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

70-86	#6 x 5/8 Washer Hd. Wood Screw Steel Stat. Bronze (8 used on S-16516-5 Used 2-160)	.60C
80-604	Hinge Spring (2 used)	.15
83-1698	Rubber Channel Strip (Used on Esc.)	.20
	Esc. Mtg.)	.02
138-33	Metal Grill	5.00
165-9	Glides (2 used)	.03

PARTS LIST

PART NO.	DESCRIPTION	PRICE
	DIAL ASSEMBLY	
26-429	Dial Scale & Glass (F.M. Band)	.65
46-522	Dummy Knob	.11
46-538	Tuning Knob	.10
46-718	Band Switch & Vol. Control Knob (2 used)	.15
46-831	Tone Control Knob	.10
54-292	Speed Nut - Tinnerman (Used on 94-671)	.01
76-578	Tuning Control Shaft	.10
78-872	Dial Light Socket & Wire	.35
80-69	Dial Cord Spring	.05
80-402	Dial Cord Spring	.03
80-746	Pulley Retaining Spring	.02
80-801	Tuner Arm Tension Spring	.08
93-993	Insulating Washer (2 used)	.02
94-671	Pointer Pulley Bushing	.10
100-97	Pilot Light Bulb	.25
148-122	Tuner Arm	.20
S-16281	Pointer Pulley & Shaft Assembly	.30
S-16346	Dial Cord & Eyelet Assembly (Long)	.06
S-16351	Dial Scale & Brkt. Assembly	.70
S-16740	Dial Cord & Eyelet Assembly (Short)	.05
	COILS & CHOKES	
95-1102	2nd. I. F. Transformer	1.60
95-1150	2nd. I. F. Tranformer	1.50
95-1152	3rd. I. F. Transformer	1.40
95-1153	Disc. Trans.	1.50
95-1200	1st. I. F. Transformer	1.60
95-1201	1st. I. F. Transformer	1.50
S-15691	F.M. Osc. Coil Assembly	.40
S-15743	F.M. Detector Coil Assembly	.65
S-16344	Broadcast Det. Coil Assembly	.60
S-16345	Broadcast Osc. Coil Assembly	.60
S-16408	Antenna Choke Coil Assembly	.25
	CONDENSERS	
22-3	.01 Mfd. Ceramic 500V	.26
22-4	.004 Mfd. Ceramic 500V	.26
22-5	110 Mmfd. Ceramic (or 22-1669) 500V	.26
22-448	.004 Mfd. 600V	.20
22-669	.01 Mfd. 600V	.20
22-829	.05 Mfd. 200V	.20
22-854	.0005 Mfd. 600V	.20
22-1220	.002 Mfd. 600V	.20
22-1367	50 Mmfd. Ceramic 500V	.33
22-1506	22 Mmfd. Ceramic 500V	.33
22-1676	.001 Mfd. Ceramic 500V	.40
22-1705	30 Mmfd. 500V	.20
22-1717	.001 Mfd. 200V	.20
22-1762	1 Mmfd. Ceramic 500V	.20
22-1775	.047 Mfd. (Molded) 400V	.26
22-1852	7.5 Mmfd. Ceramic 500V	.35
22-2104	Three Section Variable Cond.	3.80
22-2105	Elect. 80-40 Mfd. 250V	3.00
	RESISTORS	
63-1726	39 Ohm 1/2W 10% Ins. Res.	.21
63-1737	68 Ohm 1/2W 20% Ins. Res.	.21
63-1744	100 Ohm 1/2W 20% Ins. Res.	.21
63-1758	220 Ohm 1/2W 20% Ins. Res.	.21
63-1772	470 Ohm 1/2W 20% Ins. Res.	.21
63-1782	820 Ohm 1/2W 10% Ins. Res.	.21

PART NO.	DESCRIPTION	PRICE
	RESISTORS	
63-1806	3300 Ohm 1/2W 10% Ins. Res.	.21
63-1827	10K Ohm 1/2W 10% Ins. Res.	.21
63-1828	10K Ohm 1/2W 20% Ins. Res.	.21
63-1834	15K Ohm 1/2W 10% Ins. Res.	.21
63-1845	27K Ohm 1/2W 10% Ins. Res.	.21
63-1856	47K Ohm 1/2W 20% Ins. Res.	.21
63-1869	100K Ohm 1/2W 10% Ins. Res.	.21
63-1870	100K Ohm 1/2W 20% Ins. Res.	.21
63-1876	150K Ohm 1/2W 10% Ins. Res.	.21
63-1898	470K Ohm 1/2W 20% Ins. Res.	.21
63-1912	1 Megohm 1/2W 20% Ins. Res.	.21
63-1926	2.2 Megohm 1/2W 20% Ins. Res.	.21
63-1940	4.7 Megohm 1/2W 20% Ins. Res.	.21
63-1947	6.8 Megohm 1/2W 20% Ins. Res.	.21
63-1981	120 Ohm 1W 10% Ins. Res.	.24
63-2062	Vol. Control & Switch	1.81
63-2063	Tone Control	1.20
63-2068	Candohm Resistors - Two Section	1.00
63-2091	820 Ohm W.W. 1/2W 20% Ins. Res.	.21
63-2093	47 Ohm W.W. 1W 10% Ins. Res.	.24
	MISCELLANEOUS	
49-678	10" P.M. Speaker	8.50
	208-678 Cone & Voice Coil	3.41
54-303	Speed Nut - Tinnerman (5 used on Esc. Mtg.)	.01
57-1481	Esc. Clamping Plate	.02
57-1613	Emblem Plate	.20
57-1616	Escutcheon	3.20
70-86	#6 x 5/8" Washer Hd. Wood Screw Stat. Bronze (7 used S-16498)	.60C
78-755	Octal Tube Socket (2 used)	.18
78-807	Miniature Tube Socket	.15
78-854	Miniature Tube Socket	.35
78-869	Miniature Tube Socket	.20
78-870	Miniature Tube Socket	.15
78-871	Miniature Tube Socket	.15
80-780	Iron Core Tension Spring	.05
83-1698	Rubber Channel Strip	.20
83-1701	Chassis Insulating Strip	.50
85-477	Band Switch	3.00
93-968	.046 x .171 x 1/2 Steel Washer Cad. (2 used on Esc. Mtg.)	.01
95-1188	Auto Power Trans.	4.30
95-1189	Output Trans.	2.25
97-293	Chassis Mtg. Insulating Stud	.18
114-148	#10 x 7/8" Hex Washer Hd. S.T. Screw (3 used Chassis Mtg.)	1.20C
114-297	#6 x 1/4" Hex Hd. Sl. S.T. (2 used on Esc.)	.01
114-313	#8 x 1/2" Hex Hd. Sl. S.T. (4 used on Esc. Mtg.)	.02
149-95	Iron Core & Spring	.30
165-9	Glides (4 used)	.03
188-30	Retaining Ring (Used on 85-477)	1.20C
196-135	Dust Gasket	.55
202-697	F.M. Instruction Book	.10
202-774	Instruction Book	.10
S-16161	Speaker Cable & Eyelet Assembly	.20
S-16359	Wavemagnet Assembly	1.10
S-16498	Cabinet Back Assembly (Complete with A.C. Cord and Wavemagnet)	3.20

Prices shown are suggested list prices and are subject to change without notice.

ZENITH RADIO CORPORATION 11/11/49

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 13, 14	Align I F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 Prim. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

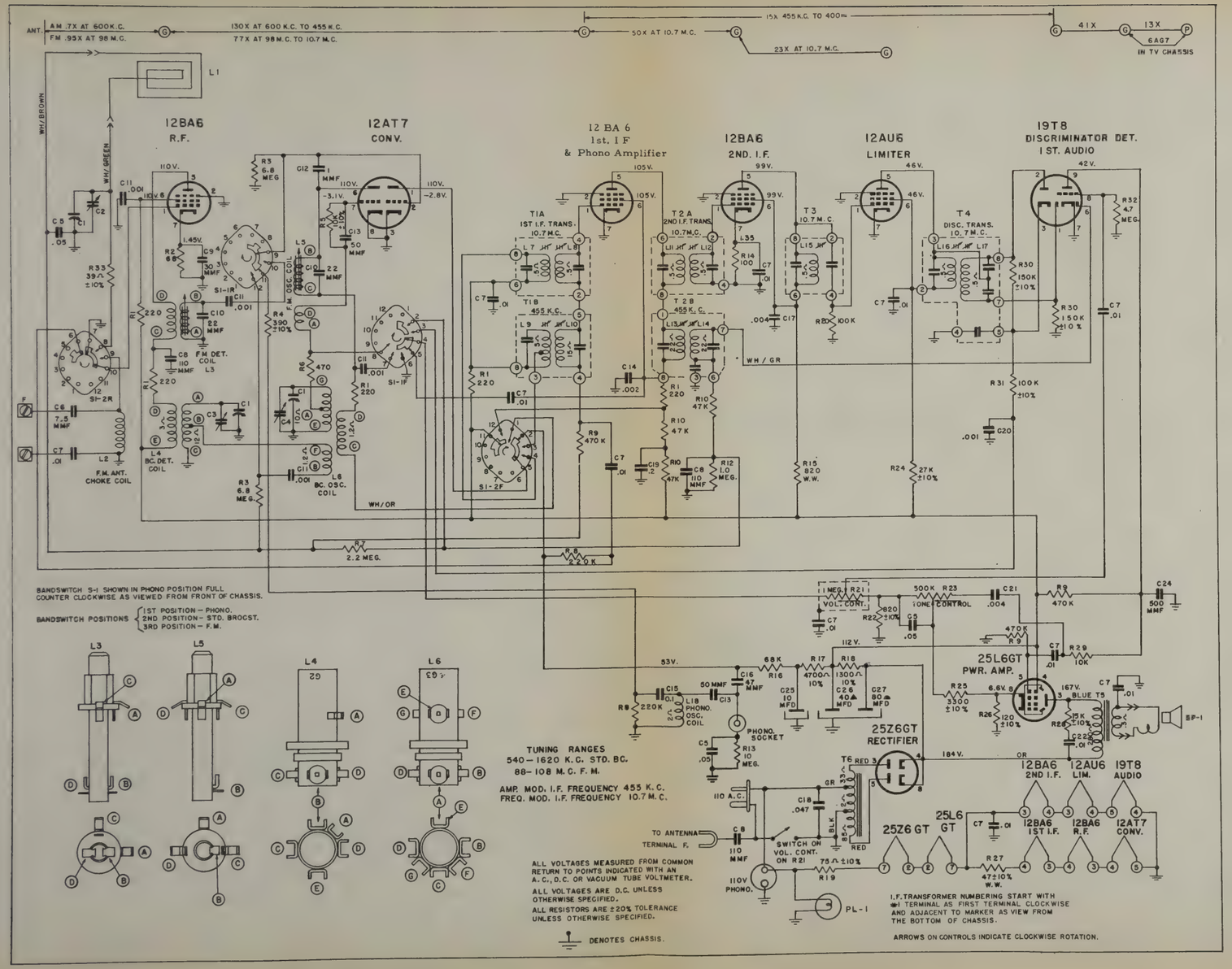
The signal generator output should be kept just high enough to get an indication on the meter.

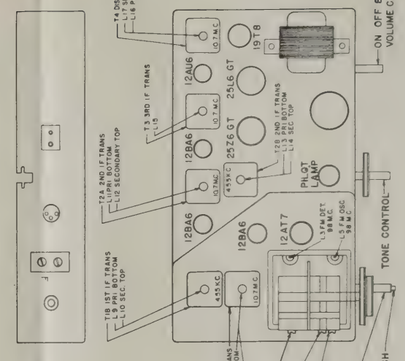
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

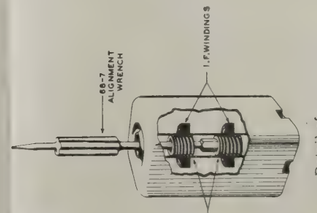
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

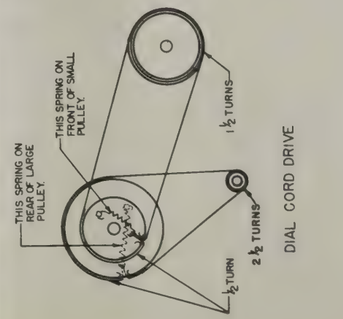




TUBE AND TRIMMER LOCATION



Detail of IF Transformer



DIAL CORD DRIVE

TO THE SERVICE MAN:

The 8G20 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all Bands.

When adjustments are made on the 8G20 chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM And FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I F transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I F transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z-8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

97-293	Chassis Mtg. Insulating Stud (3 used)	.18
114-148	#10 x 7/8 Hex Washer Hd. S.T. Screw (3 used Chassis Mtg.)	1.20C
114-313	#8 x 1/2" Hex Hd. Sl. S. T. Screw-Cad. (4 used Mtg. Esc.)	.02
138-33	Metal Grill	5.00
165-9	Glides	.03
165-14	Glides	.03
196-135	Dust Gasket	.55
202-777	Radio & Phono Instruction Book	.20
S-14025	Three Speed Changer	--
165-14	Glides (2 used)	.03
196-135	Dust Gasket	.55
202-802	Radio & Phono Inst. Book	1.00
S-140Z1	Dual Speed Record Changer	--
S-15536	Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15538	Record Changer Frame Assembly	3.10
S-15780	Cobra Tone Arm Cartridge	3.50
S-16359	Wavemagnet Assembly Type 38C	1.10
S-16516	Cabinet Back Assembly (Complete with A.C. Cord & Wavemagnet)	3.00
S-16683	Adapter Cable Assembly	2.50

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 13, 14	Align I F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 Prim. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

Part No.	Description	Price

MODEL G943 (Chassis 9E21Z)

CABINET PARTS

19-171	Connector Clip (2 used)	.01
46-697	Tuning Control Knob (2 used)	.10
46-718	Band Switch Knob	.15
46-726	Dummy Knob (2 used)	.10
49-678	10" P. M. Speaker	8.50
	208-678 Cone & Voice Coil	3.41
57-1353	Diffusing Plate	.90
57-1471	Dial Esc.	6.50
72-58	#2x3/8" Phill. Flt. Hd. Wood Screw - Steel Brass (6 used on 57-1471)	.02
93-392	3/32"x33/64" x1" Brown Felt Washer (3 used)	1.20C
165-9	Metal Glide (4 used)	.03
192-115	Dial Glass	1.50
196-109	Dial Dust Gasket	.75
202-697	F.M. Instruction Book	.10
202-817	Instruction Book	.30
S-14195	Loop Loading Coil Assy.	.70
S-14305	Low Impedance Loop Assy.	.45

RADIORGAN ESCUTCHEON ASSEMBLY

76-444	Radiorgan Knob Retaining Shaft (2 used)	.04
80-593	Radiorgan Mtg. Spring (2 used)	.08
114-321	#6x1/4" Hex Hd. Sl. S.T. Screw (2 used on S-14310 & S-14311)	.01
S-14255	Radiorgan Mtg. Brkt. Assy. (2 used)	.15
S-14273	Radiorgan Knob & Eyelet Assy. (Lo-Bass)	.20
S-14274	Radiorgan Knob & Eyelet Assy. (Bass)	.20
S-14275	Radiorgan Knob & Eyelet Assy. (Voice)	.20
S-14276	Radiorgan Knob & Eyelet Assy. (Treble)	.20
S-14277	Radiorgan Knob & Eyelet Assy. (Alto)	.20
S-14278	Radiorgan Knob & Eyelet Assy. (Normal)	.20
S-14310	Radiorgan Esc. & Knob Assy.(L.H.)	1.50
S-14311	Radiorgan Esc. & Knob Assy.(R.H.)	1.50

For parts list on Chassis refer to parts list on 9E21Z chassis.

PARTS LIST

PART NO.	DESCRIPTION	PRICE
	DIAL ASSEMBLY	
76-578	Tuning Control Shaft	.10
78-872	Dial Light Socket & Wire	.35
80-402	Dial Cord Springs (2 used)	.03
80-746	Pulley Retaining Spring	.02
80-781	Tuner Arm Tension Spring	.08
94-671	Pointer Pulley Bushing	.10
100-97	Pilot Light Bulb	.25
148-122	Tuner Arm	.20
S-16281	Pointer Pulley & Shaft Assembly	.30
S-16346	Dial Cord & Eyelet Assembly (Long)	.06
S-16347	Dial Cord & Eyelet Assembly (Short)	.05
S-16351	Dial Scale & Bracket Assembly (26-438)	.70
	COILS & CHOKES	
95-1102	2nd. I.F. Transformer	1.60
95-1150	2nd. I.F. Transformer	1.50
95-1152	3rd. I.F. Transformer	1.40
95-1153	Disc. Transformer	1.50
95-1200	1st. I.F. Transformer	1.60
95-1201	1st. I.F. Transformer	1.50
S-12603	Phono Osc. Coil Assembly	.75
S-15691	F.M. Osc. Coil Assembly	.40
S-15743	F.M. Detector Coil Assembly	.65
S-16344	Broadcast Detector Coil Assembly	.60
S-16345	Broadcast Oscillator Coil Assembly	.60
S-16408	Antenna Choke Coil Assembly	.25
	CONDENSERS	
22-3	.01 Mfd. Ceramic 500V	.26
22-4	.004 " " 500V	.26
22-5	110 Mmfd. " (or 22-1669) 500V	.26
22-177	.2 Mfd. 400V	.33
22-448	.004 Mfd. 500V	.20
22-669	.01 " 600V	.20
22-827	.1 " 200V	.23
22-829	.05 " 200V	.20
22-854	.0005 " 600V	.20
22-1220	.002 " 600V	.20
22-1367	50 Mmfd. Ceramic 500V	.33
22-1506	22 " " 500V	.33
22-1676	.001 Mfd. " 500V	.40
22-1705	30 Mmfd. " 500V	.20
22-1717	.001 Mfd. 200V	.20
22-1762	1 Mmfd. " 500V	.20
22-1775	.047 Mfd. (Molded) 400V	.26
22-1852	7.5 Mmfd. Ceramic 500V	.35
22-1876	47 " " 500V	.35
22-2104	Three Section Variable Cond.	3.80
22-2105	Elect. Cond. 80-40 Mfd. 250V	3.00
22-2154	Elect. Cond. 10 Mfd. 250V	1.25
	RESISTORS	
63-1726	39 Ohm 1/2W 10% Ins. Res.	.21
63-1736	68 Ohm 1/2W 20% Ins. Res.	.21
63-1744	100 Ohm 1/2W 20% Ins. Res.	.21
63-1758	220 Ohm 1/2W 20% Ins. Res.	.21
63-1768	390 Ohm 1/2W 10% Ins. Res.	.21
63-1772	470 Ohm 1/2W 20% Ins. Res.	.21
63-1782	820 Ohm 1/2W 10% Ins. Res.	.21
63-1806	3300 Ohm 1/2W 10% Ins. Res.	.21
63-1813	4700 Ohm 1/2W 10% Ins. Res.	.21
33-1827	10K Ohm 1/2W 10% Ins. Res.	.21
63-1828	10K Ohm 1/2W 20% Ins. Res.	.21
63-1834	15K Ohm 1/2W 10% Ins. Res.	.21
63-1845	27K Ohm 1/2W 10% Ins. Res.	.21
63-1856	47K Ohm 1/2W 20% Ins. Res.	.21
63-1863	68K Ohm 1/2W 20% Ins. Res.	.21
63-1869	100K Ohm 1/2W 10% Ins. Res.	.21
63-1870	100K Ohm 1/2W 20% Ins. Res.	.21
63-1876	150K Ohm 1/2W 10% Ins. Res.	.21
63-1884	220K Ohm 1/2W 20% Ins. Res.	.21
63-1898	470K Ohm 1/2W 20% Ins. Res.	.21
63-1912	1 Megohm 1/2W 20% Ins. Res.	.21
63-1926	2.2 Megohm 1/2W 20% Ins. Res.	.21
63-1940	4.7 Megohm 1/2W 20% Ins. Res.	.21
63-1947	6.8 Megohm 1/2W 20% Ins. Res.	.21
63-1954	10 Megohm 1/2W 20% Ins. Res.	.21
63-1981	120 Ohm 1W 10% Ins. Res.	.24
63-2062	Volume Control & Switch	1.81
63-2063	Tone Control	1.20
63-2068	Candohm - Two Section	1.00
63-2091	820 Ohm W.W. 1/2W 20% Ins. Res.	.21
63-2093	47 Ohm W.W. 1W 10% Ins. Res.	.24
	MISCELLANEOUS	
44-25	Phono Jack	.12
54-108	3/8-32 x 9/16 Palnut Cad. (1 ea. used 63-2062 & 63-2063)	.01
54-271	6-32 x 1/4" Palnut Steel Cad. (1 ea. used on L, F's.)	.01
54-292	Speed Nut-Tinnerman (Used on 94-671)	.01
58-128	Two Prong Plug (A. C. Interlock)	.15
78-461	Two Contact Socket	.07
78-755	Octal Tube Socket (2 used)	.18
78-807	Miniature Tube Socket	.15
78-854	Miniature Tube Socket (9 Contact)	.35
78-869	Miniature Tube Socket	.20
78-870	Miniature Tube Socket (2 used)	.15
78-871	Miniature Tube Socket	.15
80-780	Iron Core Tension Spring	.05
85-467	Band Switch	3.00
93-993	Insulating Washer (2 used)	.02
93-1039	Cang Mounting Cup Washer (2 used)	.01
95-1188	Auto Power Trans.	4.30
95-1189	Output Transformer (Speaker)	2.25
113-8	#6-32 x 1/4" Hex. Hd. Sl. M.S. Steel Int. Shakeproof (2 each used 22-2104 and 85-467)	1.70C
114-297	#6 x 1/4" Hex Hd. Sl. S.T. (2 used on S-16351)	.01
125-62	Rubber Grommet (3 used)	.02
125-73	Rubber Grommet (2 used)	.06
149-95	Iron Core & Spring	.30
188-30	Retaining Ring (Used on 85-467)	1.20C
S-16161	Speaker Cable & Eyelet Assembly	.20
	G 884 CABINET PARTS	
2-106	Cabinet Back (Phono-Section)	1.15
26-429	Dial Scale & Glass (F.M. Band)	.65
46-522	Dummy Knob	.11
46-538	Tuning Knob	.10
46-718	Band Switch & Volume Control Knob (2 used)	.15
46-831	Tone Control Knob	.10
49-624	12" P.M. Speaker	13.00
	208-624 Cone & Voice Coil	4.60
54-303	Speed Nut (5 used on Esc.)	.01
57-1481	Esc. Clamping Plate (2 used)	.02
57-1591	Escutcheon	4.50
57-1613	Emblem Plate	.20
70-86	#6 x 5/8 Washer Hd. Wood Screw Steel Stat. Bronze (8 used on S-16516-5 Used 2-160)	.60C
80-604	Hinge Spring (2 used)	.15
83-1698	Rubber Channel Strip (Used on Esc.)	.20
97-293	Chassis Mtg. Insulating Stud (3 used)	.18
114-148	#10 x 7/8 Hex Washer Hd. S.T. Screw (3 used Chassis Mtg.)	1.20C
114-313	#8 x 1/2" Hex Hd. Sl. S. T. Screw-Cad. (4 used Mtg. Esc.)	.02
138-33	Metal Grill	5.00
165-9	Glides	.03
165-14	Glides	.03
196-135	Dust Gasket	.55
202-777	Radio & Phono Instruction Book	.20
S-14025	Three Speed Changer	--
S-15536	Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15780	Cobra Cartridge	3.50
S-16196	Record Changer Mtg. Frame & Arm Assem.	8.00
S-16359	Wavemagnet Assembly	1.10
S-16516	Cabinet Back Assembly (Complete with A.C. Cord and Wavemagnet) (Radio Section)	3.00
	G885 CABINET PARTS	
2-165	Cabinet Back (Phono Section)	.35
19-123	Record Changer Mtg. Clip (4 used)	.10
26-429	Dial Scale (F.M. Band)	.65
43-185	Record Changer Housing	2.50
46-522	Dummy Knob	.11
46-538	Tuning Knob	.10
46-718	Band Switch & Volume Control Knob	.15
46-831	Tone Control Knob	.10
49-678	10" P.M. Speaker #208-678 Cone & Voice Coil	3.41
54-303	Speed Nut-Tinnerman (5 used on Esc.)	.01
57-1481	Esc. Clamping Plate (2 used)	.02
57-1591	Escutcheon	4.50
57-1613	Emblem Plate	.20
70-86	#6 x 5/8" Washer Hd. Wood Screw - Steel Stat. Bronze (5 used S-16513 & 4 used 2-165)	.60C
70-98	#8 x 5/8" R.H. Wood Screw-Steel N.P. (3 used on S-16508)	1.20C
83-1698	Rubber Channel Strip	.20
83-1721	Roller Bearing Strip	.15
83-1722	Latch Support Strip	.02
97-293	Chassis Mtg. Insulating Stud (3 used)	.18
112-791	Record Changer Mtg. Screw (4 used)	.20
113-25	6-32 x 3/8 Hex Hd. Sl. M.S. Shakeproof Lockwasher (2 used on 156-20)	.03
114-148	#10 x 7/8" Hex Washer Hd. S.T. Screws (3 used Chassis Mtg.)	1.20C
114-253	6-20 x 3/8 Hex Hd. Sl. S.T. Screw Cad. Shakeproof (4 used on S-16509)	.84C
114-313	#8 x 1/2" Hex Hd. Sl. S. T. Screw (4 used on Esc.)	.02
125-76	Rubber Grommet (4 used on Changer)	.25
156-20	Record Changer Housing Latch	.55
165-9	Glides (2 used)	.03
165-14	Glides (2 used)	.03
196-135	Dust Gasket	.55
202-776	Radio & Phono Inst. Book	.70
S-14026	Twin Seven Record Changer	--
S-15222	Cobra Tone Arm Cartridge	3.50
S-16359	Wavemagnet Assembly Type 38C	1.10
S-16508	Channel Brkt. & Lever Assembly	.45
S-16509	Channel Brkt. & Roller Assembly	.70
S-16513	Cabinet Back Assembly (Complete with A.C. Cord & Wavemagnet)	3.50
	G 883E CABINET PARTS	
26-429	Dial Scale	.65
46-522	Dummy Knob	.11
46-538	Tuning Knob	.10
46-718	Band Switch & Volume Control Knob	.15
46-831	Tone Control Knob	.10
49-624	12" P.M. Speaker	13.00
	208-624 Cone & Voice Coil	4.60
54-303	Speed Nut Tinnerman (5 used on Esc.)	.01
57-1481	Esc. Clamping Plate (2 used)	.02
57-1591	Esc.	4.50
57-1613	Emblem Plate	.20
70-86	#6 x 5/8 Washer Hd. Wood Screw Steel Stat. Bronze (5 used on S-16641)	.60C
80-604	Hinge Spring (2 used)	.15
83-1698	Rubber Channel Strip	.20
93-968	.046 x .171 x 1/2" Steel Washer (2 used on Esc.)	.01
97-293	Chassis Mtg. Insulating Stud (3 used)	.18
114-148	#10 x 7/8 Hex Washer Hd. St. T. Screw (3 used Chassis Mtg.)	1.20C
114-313	#8 x 1/2" Hex Hd. Sl. S.T. Screw (4 used on Esc. Mtg.	.02
165-9	Glides (2 used)	.03
165-14	Glides (2 used)	.03
196-135	Dust Gasket	.55
202-777	Radio & Phono Insutruction Book	.20
S-14025	Three Speed Record Changer	--
S-15536	Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15780	Cobra Tone Arm Cartridge	3.50
S-16196	Record Changer Mtg. Frame & Arm Assem.	8.00
S-16359	Wavemagnet Assembly Type 38C	1.10
S-16641	Cabinet Back Assembly (Complete with A.C. Cord & Wavemagnet)	3.50
	G 882R CABINET PARTS	
	G882R is the same as G883E except the following:	
	Omit:	
S-16641	Cabinet Back Assembly (Complete)	
	Add:	
S-16513	Cabinet Back Assembly (Complete with A.C. Cord & Wavemagnet)	3.50
	G 881 CABINET PARTS	
2-179	Cabinet Back (Phono-Section)	1.15
19-169	Record Changer Mtg. Clip (4 used)	.07
22-2144	150 Mmfd. Ceramic Cond. 500V	.26
26-429	Dial Scale	.65
46-522	Dummy Knob	.11
46-538	Tuning Knob	.10
46-718	Band Switch & Vol. Control Knob (2 used)	.15
46-831	Tone Control Knob	.10
49-624	12" P.M. Speaker	13.00
	208-624 Cone & Voice Coil	4.60
54-303	Speed Nut (5 used on Esc. Mtg.)	.01
57-1481	Esc. Clamping Plate (2 used)	.02
57-1591	Escutcheon	4.50
57-1613	Emblem Plate	.20
58-75	Connector Plug	.07
58-86	Two Prong Plug	.12
70-66	#8 x 1/2" R.H.W.S. Steel N.P. (2 used on 95-1228)	1.30C
70-86	#6 x 5/8 Washer Hd. Wood Screw Steel Stat. Bronze (5 used on S-16516 & 8 used 2-179)	.60C
78-750	Six Contact Socket (used on S-16683)	.25
80-604	Hinge Spring (2 used)	.15
80-678	Record Changer Mtg. Spring (4 used)	.04
83-1245	Record Changer Trim Strip	1.00
83-1698	Rubber Channel Strip	.20
93-968	.046 x .171 x 1/2" Steel Washer Cad. (2 used on Esc. Mtg.)	.01
95-1228	Filament Transformer	1.50
97-293	Chassis Mtg. Insulating Stud (3 used)	.18
112-712	Record Changer Mtg. Screw	.08
114-148	#10 x 7/8 Hex Washer Hd. S. T. Screw (3 used Chassis Mtg.)	1.20C
114-313	#8 x 1/2" Hex Hd. Sl. S. T. Screw (4 used on Esc. Mtg.)	.02
138-33	Metal Grill	5.00
165-9	Glides (2 used)	.03
165-14	Glides (2 used)	.03
196-135	Dust Gasket	.55
202-802	Radio & Phono Inst. Book	1.00
S-14021	Dual Speed Record Changer	--
S-15536	Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15538	Record Changer Frame Assembly	3.10
S-15780	Cobra Tone Arm Cartridge	3.50
S-16359	Wavemagnet Assembly Type 38C	1.10
S-16516	Cabinet Back Assembly (Complete with A.C. Cord & Wavemagnet)	3.00
S-16683	Adapter Cable Assembly	2.50

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 13, 14	Align I F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 Prim. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

Part No.	Description	Price

MODEL G943 (Chassis 9E21Z)

CABINET PARTS

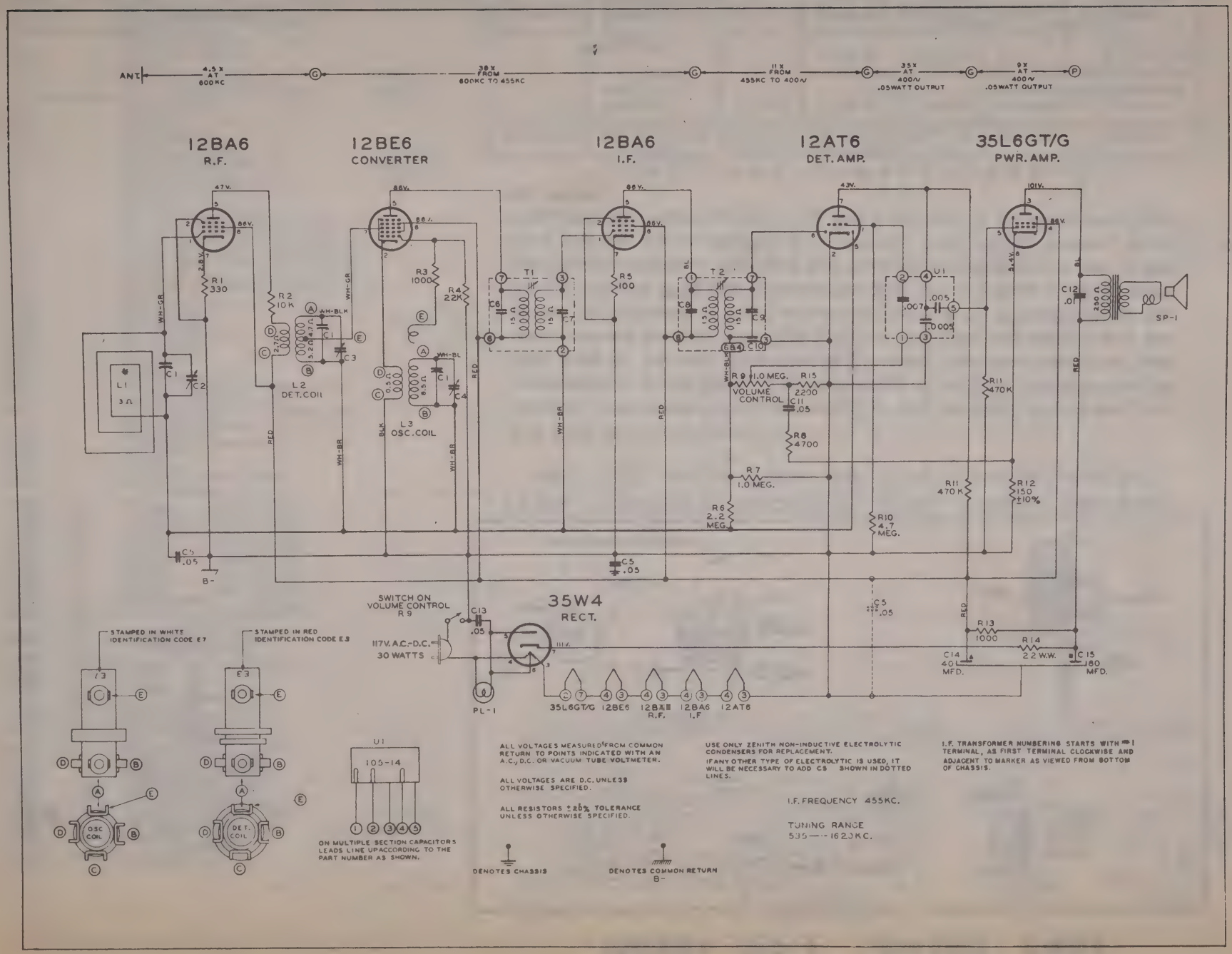
19-171	Connector Clip (2 used)	.01
46-697	Tuning Control Knob (2 used)	.10
46-718	Band Switch Knob	.15
46-726	Dummy Knob (2 used)	.10
49-678	10" P. M. Speaker	8.50
	208-678 Cone & Voice Coil	3.41
57-1353	Diffusing Plate	.90
57-1471	Dial Esc.	6.50
72-58	#2x3/8" Phill. Flt. Hd. Wood Screw - Steel Brass (6 used on 57-1471)	.02
93-392	3/32"x33/64" x1" Brown Felt Washer (3 used)	1.20C
165-9	Metal Glide (4 used)	.03
192-115	Dial Glass	1.50
196-109	Dial Dust Gasket	.75
202-697	F.M. Instruction Book	.10
202-817	Instruction Book	.30
S-14195	Loop Loading Coil Assy.	.70
S-14305	Low Impedance Loop Assy.	.45

RADIORGAN ESCUTCHEON ASSEMBLY

76-444	Radiorgan Knob Retaining Shaft (2 used)	.04
80-593	Radiorgan Mtg. Spring (2 used)	.08
114-321	#6x1/4" Hex Hd. Sl. S.T. Screw (2 used on S-14310 & S-14311)	.01
S-14255	Radiorgan Mtg. Brkt. Assy. (2 used)	.15
S-14273	Radiorgan Knob & Eyelet Assy. (Lo-Bass)	.20
S-14274	Radiorgan Knob & Eyelet Assy. (Bass)	.20
S-14275	Radiorgan Knob & Eyelet Assy. (Voice)	.20
S-14276	Radiorgan Knob & Eyelet Assy. (Treble)	.20
S-14277	Radiorgan Knob & Eyelet Assy. (Alto)	.20
S-14278	Radiorgan Knob & Eyelet Assy. (Normal)	.20
S-14310	Radiorgan Esc. & Knob Assy.(L.H.)	1.50
S-14311	Radiorgan Esc. & Knob Assy.(R.H.)	1.50

For parts list on Chassis refer to parts list on 9E21Z chassis.

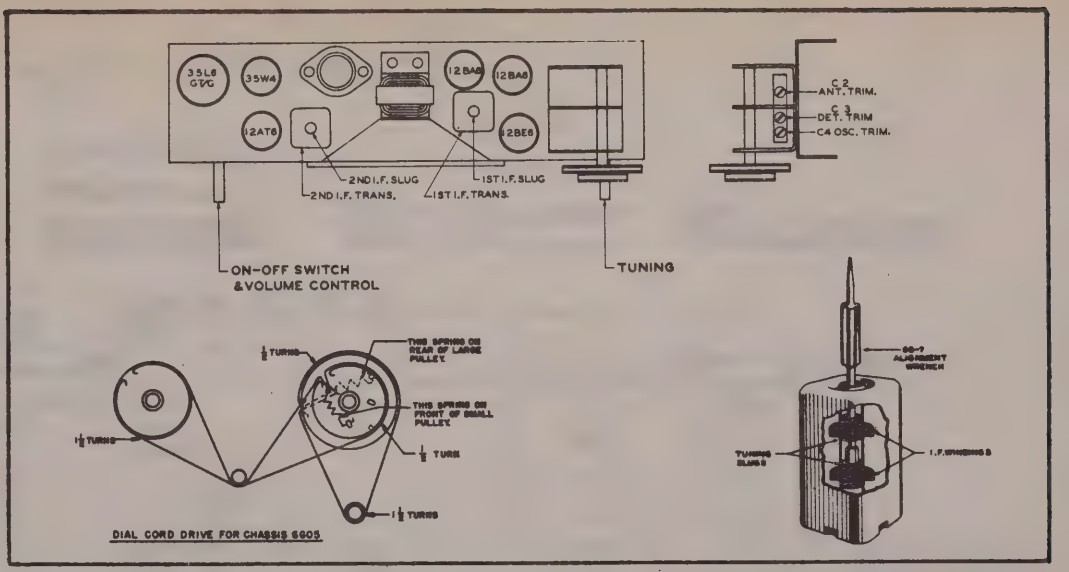
MODEL H615 CHASSIS 6G05



MODEL H615 CHASSIS 6G05

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION
		Dial Assembly
76-519		Tuning Shaft
78-824		Dial Light Socket & Wire
80-69		Dial Cord Tension Spring
80-209		Dial Cord Tension Spring
97-284		Dial Cord Guide Stud
100-67		Dial Light Bulb 6.3V -.150A
188-32		Retaining Ring (used on 76-519)
188-60		Retaining Ring (used on S-14867)
S-14834		Dial Cord & Eyelet Assem. (Short)
S-14867		Pointer Pulley & Bushing Assem.
S-14868		Pointer Pulley Brkt. & Stud Assem.
S-16593		Dial Cord & Eyelet Assem. (Long)
		Coils & Chokes
95-1101	T1	1st I.F. Transformer
95-1102	T2	2nd I.F. Transformer
S-14832	L2	Detector Coil Assem.
S-14833	L3	Osc. Coil Assem.
		Condensers
22-178	C11	.05 Mfd. 200V
22-829	C5	.05 Mfd. 200V
22-1017	C13	.05 Mfd. 400V
22-1182	C12	.01 Mfd. 400V
22-1808	C14, C15	Elect. Cond. 80-40 Mfd. 150V
22-2158	C1	Three Section Variable Gang Cond.
105-14	U1	Multiple Capacitor Unit
		Resistors
63-1219	R14	22 ohm W.W. 1/2W 20% Ins. Res.
63-1574	R13	1000 ohm 1W 20% Ins. Res.
63-1664	R9	Vol. Control Switch
63-1744	R5	100 ohm 1/2W 20% Ins. Res.
63-1765	R1	330 ohm 1/2W 20% Ins. Res.
63-1786	R3	1000 ohm 1/2W 20% Ins. Res.
63-1800	R15	2200 ohm 1/2W 20% Ins. Res.
63-1814	R8	4700 ohm 1/2W 20% Ins. Res.
63-1828	R2	10K ohm 1/2W 20% Ins. Res.
63-1842	R4	22K ohm 1/2W 20% Ins. Res.
63-1898	R11	470K ohm 1/2W 20% Ins. Res.
63-1912	R7	1 Megohm 1/2W 20% Ins. Res.
63-1926	R6	2.2 Megohm 1/2W 20% Ins. Res.
63-1940	R10	4.7 Megohm 1/2W 20% Ins. Res.
63-1977	R12	150 ohm 1W 10% Ins. Res.
		Miscellaneous
11-85		Line Cord & Plug
14-1274		Plastic Cabinet for H615 Table Model
16-660		Packing Carton
26-452		Dial Scale
43-165		Handle Housing
46-745		Tuning & Volume Control Knob (2 used)
49-643		5 1/4" P. M. Speaker 208-643 Cone & Output Trans. 206-643 Output Trans.
54-30		#8-32x5/16" Hex Nut Steel N.P. (2 used on Spkr. Mtg.)
54-129		Speed Nut (10 used on dial scale mtg.)
54-139		#3/8-32x9/16" Palnut Cad. (used on 63-1664)
54-267		#6-32x5/16" Palnut Cad. (1 ea. used 95-1101 & 1102)
57-1688		Cabinet Front Plate
59-252		Dial Pointer
78-275		Elect. Cond. Socket
78-611		Octal Tube Socket
78-806		Miniature Tube Socket
78-807		Miniature Tube Socket (4 used)
83-1057		Line Cord Insulating Strip
83-1393		Rubber Strip - Handle
83-1789		Handle Strip (Rubber)
83-1833		Dial Scale Rubber Strip (4 used)
93-138		Felt Washer
93-487		1/16"x.144x3/8" Steel Washer (2 used on 43-165)
94-334		Gang Cond. Mtg. Bushing (3 used)
110-155		Grill Cloth
112-697		#6x3/8 S.T. Screw Cad. Hex Hd. S1. (2 used chassis mtg.)
114-67		#6-32x7/16" Hex Acorn Hd. M.S. Steel (3 used on gang)
114-192		#6x7/16" Hex Hd. S1. S.T. Screw (2 used on chassis mtg.)
114-201		#8x5/16" Hex Hd. S1. S.T. Screw (2 used spkr. mtg.)
114-261		#8-32x1/8" Hex Hd. S1. S.T. Screw (2 used on 43-165)
114-291		#8-32x7/16" Hex Hd. S1. M.S. Steel (2 used on spkr. mtg.)
125-17		Rubber Grommet (3 used on gang)
139-92		Baffle Board
139-95		Speaker Baffle (Rubber)
159-69		Trimount Stud St. Br. (4 used on S-17379)
166-41		Rubber Bumper (or 166-44)
171-12		Pilot Light Lens
188-54		Clamping Ring (used on 59-252)
188-136		Trim Ring
196-154		Grill Cloth Support Gasket
199-103		Flexible Handle Sleeve
202-843		Instruction Book
S-13210		Strap & Rivet Assem.
S-17379		Wavemagnet Assem.
Model H615W is the same as H615 except the following		
14-1275		Plastic Cabinet for H615W Table Model (white)
46-745Y		Tuning & Volume Control Knob (2 used)
59-253		Dial Pointer
110-156		Grill Cloth
199-103Y		Flexible Handle Sleeve
S-17380		Wavemagnet Assem.
Model H615Y is the same as H615 except the following:		
14-1276		Plastic Cabinet for H615Y Table Model (black)
46-745Y		Tuning & Volume Control Knob (2 used)
59-253		Dial Pointer
110-156		Grill Cloth
199-103Y		Flexible Handle Sleeve



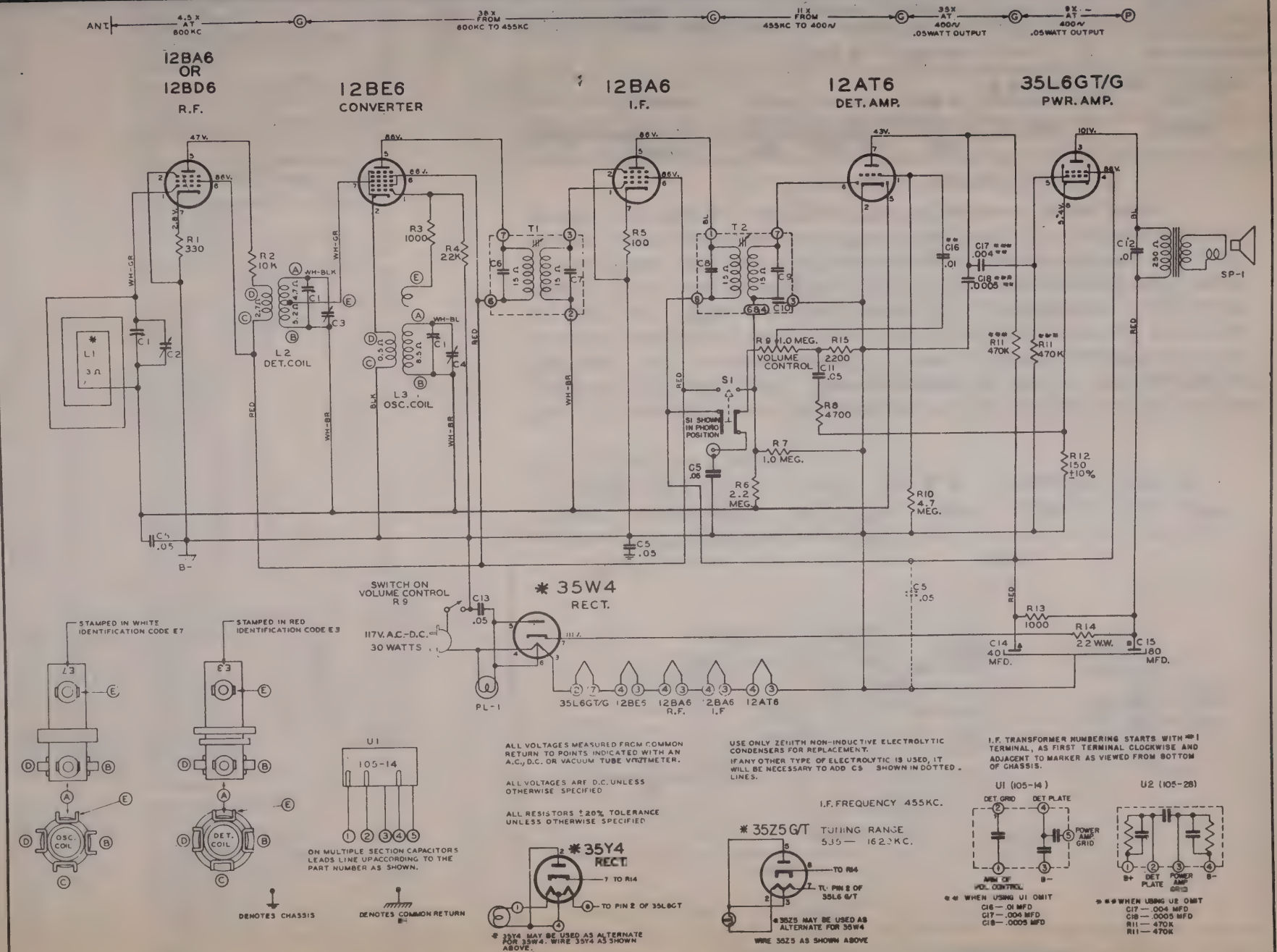
TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I.F. Alignment
2	Single Turn Loosely Coupled to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-3	Detector Alignment
4		--	1400 Kc.	1400 Kc.	C-2	Antenna Alignment


ANT.
4.5 X AT 800 KC
38 X FROM 600 KC TO 455 KC
11 X FROM 455 KC TO 400 KC
35 X AT 400 KC .05 WATT OUTPUT
8 X AT 400 KC .05 WATT OUTPUT
12BA6 OR 12BD6 R.F.
12BE6 CONVERTER
12BA6 I.F.
12AT6 DET. AMP.
35L6GT/G PWR. AMP.
R1 330
R2 10K
R3 1000
R4 22K
R5 100
R6 2.2 MEG.
R7 1.0 MEG.
R8 4700
R9 1.0 MEG. VOLUME CONTROL
R10 4.7 MEG.
R11 470K
R12 150 ±10%
R13 1000
R14 2.2 W.W.
R15 2200
C1 C2 C3 C4 C5 .05
C6 C7 C8 C9 15 µµF
C10 68 µµF
C11 .05
C12 .01
C13 .05
C14 40 MFD.
C15 80 MFD.
C16 .01
C17 .004
C18 .0005
T1
T2
L1 3Ω
L2 DET. COIL
L3 OSC. COIL
S1
S1 SHOWN IN PHONO POSITION
SP-1
SWITCH ON VOLUME CONTROL R9
117 V. A.C.-D.C. 30 WATTS
* 35W4 RECT.
PL-1
35L6GT/G 12BE6 12BA6 R.F. 12BA6 I.F. 12AT6
STAMPED IN WHITE IDENTIFICATION CODE E7
STAMPED IN RED IDENTIFICATION CODE E3
OSC. COIL
DET. COIL
U1
105-14
ON MULTIPLE SECTION CAPACITORS LEADS LINE UP ACCORDING TO THE PART NUMBER AS SHOWN.
DENOTES CHASSIS
DENOTES COMMON RETURN
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED
* 35Y4 RECT.
TO R14
TO PIN 8 OF 35L6GT
* 35Y4 MAY BE USED AS ALTERNATE FOR 35W4. WIRE 35Y4 AS SHOWN ABOVE.
USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT.
IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT WILL BE NECESSARY TO ADD C5 SHOWN IN DOTTED LINES.
I.F. FREQUENCY 455 KC.
* 35Z5 G/T TUNING RANGE 535 — 1620 KC.
TO R14
TO PIN 8 OF 35L6 G/T
* 35Z5 MAY BE USED AS ALTERNATE FOR 35W4
WIRE 35Z5 AS SHOWN ABOVE
I.F. TRANSFORMER NUMBERING STARTS WITH * 1 TERMINAL, AS FIRST TERMINAL CLOCKWISE AND ADJACENT TO MARKER AS VIEWED FROM BOTTOM OF CHASSIS.
U1 (105-14)
DET. GRID
DET. PLATE
POWER AMP. GRID
AVC OR VOL. CONTROL
B-
U2 (105-28)
B+
DET. PLATE
POWER AMP.
B-
** WHEN USING U1 OMIT
C16 — .01 MFD
C17 — .004 MFD
C18 — .0005 MFD
** WHEN USING U2 OMIT
C17 — .004 MFD
C18 — .0005 MFD
R11 — 470K
R11 — 470K

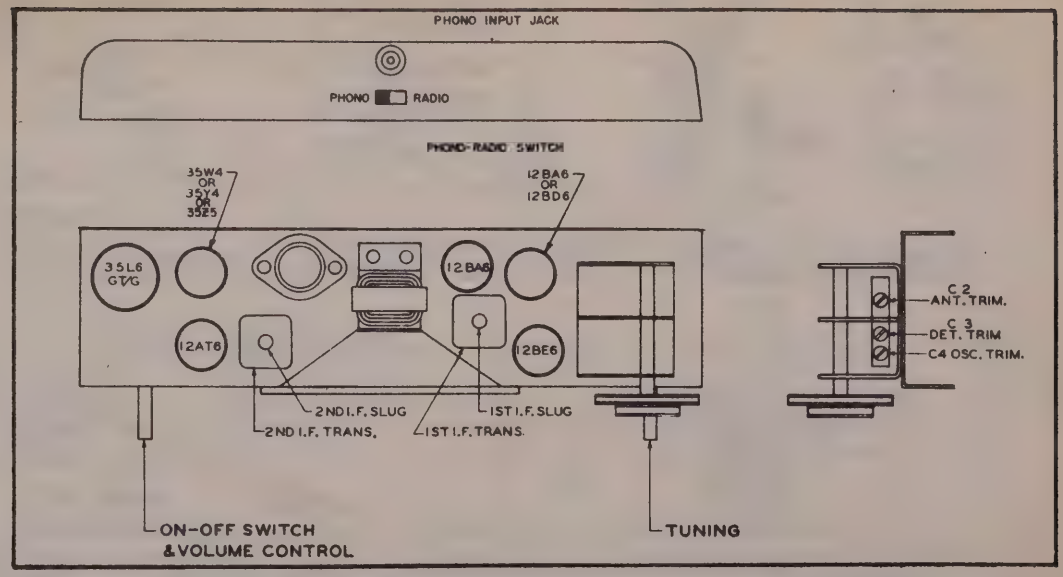
PARTS LIST

PART NO.	DIAG. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-452		Dial Scale	1.70
59-252		Dial Pointer	.30
59-253		Dial Pointer (Used on W & Y models only)	.30
76-519		Tuning Shaft	.20
78-882		Dial Light Socket & Wire	.35
80-69		Dial Cord Tension Spring	.05
80-209		Dial Cord Tension Spring	.03
100-67	PL1	Dial Light Bulb	.10
171-12		Pilot Light Lens	.10
188-32		Retaining Ring (Used on 76-519)	1.03C
188-54		Clamping Ring (Used on Dial Pointer)	.02
188-60		Retaining Ring (Used on S-14867)	.02
S-14834		Dial Cord & Eyelet Assem. (Short)	.05
S-14867		Pointer Pulley & Bushing Assem.	.25
S-14868		Brkt. & Stud Assem.	.15
S-16593		Dial Cord & Eyelet Assm. (Long)	.07
		Coils & Chokes	
95-1101	T1	1st. I.F. Transformer	1.60
95-1102	T2	2nd I.F. Transformer	1.60
S-14832	L2	Detector Coil Assem.	1.10
S-14833	L3	Oscillator Coil Assem.	1.10
		Condensers	
22-3	C16	.01 Mfd. 500V	
22-178	C11	.05 Mfd. 200V	.20
22-448	C17	.004 Mfd. 600V	
22-829	C5	.05 Mfd. 200V	.20
22-894	C18	.0005 Mfd. 600V	
22-1017	C13	.05 Mfd. 400V	.20
22-1182	C12	.01 Mfd. 400V	.20
22-1808	C14,C15	Elec. Cond. 80-40 Mfd. 150V	2.20
22-2158	C1	Three Section Gang Cond.	3.30
105-14	U1	Multiple Capacitor Unit (or 105-28)	.75
		Resistors	
63-1219	R14	22 Ohm W.W. 1/2W 20% Ins. Res.	.21
63-1574	R13	1000 Ohm 1 W 20% " "	.24
63-1664	R9	Volume Control & Switch	1.81
63-1744	R5	100 Ohm 1/2W 20% Ins. Res.	.21
63-1765	R1	330 Ohm 1/2W 20% " "	.21
63-1786	R3	1000 Ohm 1/2W 20% " "	.21
63-1800	R15	2200 Ohm 1/2W 20% " "	.21
63-1814	R8	4700 Ohm 1/2W 20% " "	.21
63-1828	R2	10K Ohm 1/2W 20% " "	.21
63-1842	R4	22K Ohm 1/2W 20% " "	.21
63-1898	R11	470K Ohm 1/2W 20% " " (2 used)	.21
63-1912	R7	1 Megohm 1/2W 20% " "	.21
63-1926	R6	2.2 Megohm 1/2W 20% " "	.21
63-1940	R10	4.7 Megohm 1/2W 20% " "	.21
63-1977	R12	150 Ohm 1 W 10% " "	.24
		Miscellaneous	
11-85		Line Cord & Plug	.65
14-1320		Plastic Cabinet for H615Z	
14-1321		Plastic Cabinet for H615WZ	
14-1322		Plastic Cabinet for H615YZ	
16-660		Packing Carton	
44-25		Phono Jack	.12
46-745		Tuning & Vol. Control Knob (2 used)	.15
46-745Y		Tuning & Vol. Control Knob (2 used) (W & Y Model only)	.15
49-643	SP1	5-1/4" PM Speaker	8.25
		TS-2035 Output Transformer	1.40
		ZC-5091 Cone & Voice Coil	1.73
54-129		Speed Nut (10 used on mtg. dial scale & gasket)	.60C
54-139		#3/8-32 x 9/16" Palnut Type N Cad. (used on 63-1664)	.09
54-267		#6-32 x 5/16" Palnut (1 ea. used on 95-1101 & 95-1102)	.45C
57-1688		Cabinet Front Plate	1.10
78-275		Elect. Cond. Socket	.03
78-596		Loktal Tube Socket (used only when 35Y4 is used)	.18
78-611		Octal Tube Socket	.12
78-801		Octal Tube Socket (used only when 35Z5GT is used)	.15
78-807		Miniature Tube Socket (4 used)	.15
78-810		Miniature Tube Socket (used only when 35W4 is used)	.15
83-1833		Rubber Strip (used with Dial Scale)	.02
85-495	S1	Phono-Radio Switch	
94-334		Gang Cond. Mtg. Bushing (3 used)	.67C
110-155		Grill Cloth	.10
110-156		Grill Cloth (used on W&Y Model only)	.10
114-192		#6 x 7/16" Hex. Hd. S.T. (2 used on Chassis Mtg.)	.84C
139-92		Baffle Board	.30
139-95		Speaker Baffle (Rubber)	.05
159-69		Trimount Stud-St.Br. (4 used on Wavemagnet)	.01
166-41		Rubber Bumper (or 166-44) (used on Gang Cond)	.03
188-136		Trim Ring	.20
196-154		Grill Cloth Support Gasket	.03
202-886		Instruction Book	
S-18134		Wavemagnet Assem.	

Prices shown are suggested list prices, and are subject to change without notice.

ZENITH RADIO CORPORATION 2/15/51

MODEL H615Z CHASSIS 6G05



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I.F. Alignment
2	Single Turn Loosely Coupled to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-3	Detector Alignment
4		--	1400 Kc.	1400 Kc.	C-2	Antenna

PARTS LIST

MODELS H665, H665R, H665Z, H665RZ, H661E & H661R
CHASSIS 6H01

Coils & Chokes

95-1101	T1 - 1st. I.F. Transformer	1.60
95-1102	T2 - 2nd. I.F. Transformer	1.60
S-12603	L7 - Phono Oscillator Coil Assembly	.75
S-13799	L2 - Oscillator Coil Assembly	.75

Condensers

22-3	C8 - .01 Mfd. Ceramic (Disc.) 500V (3 used)	.26
22-4	C10 - .004 Mfd. Ceramic (Disc.) 500V	.26
22-5	C5 - 110 Mmfd. Ceramic (Disc.) (or 22-162) 500V	.26
22-178	C9 - .05 Mfd. 200V	.20
22-829	C4 - .05 Mfd. 200V (3 used)	.20
22-854	C6 - .0005 Mfd. 600V (2 used)	.20
22-1182	C11 - .01 Mfd. 400V	.20
22-1444	C7 - .001 Mfd. 200V	.20
22-1701	C17 - 100 Mmfd. Ceramic 500V	.20
22-1775	C18 - .047 Mfd. 400V	.26
22-2085	C1 - Variable - 2 gang	3.00
22-2272	C12,13,14 Elect. - 20 Mfd. 150V x 40 Mfd. 150V x 80 Mfd. - 150V	2.50
22-2241	C15 - .002 Mfd. Ceramic 500V	.35
22-2242	C16 - Trimmer Capacitor	.40

Resistors

63-1219	R14 - 22 ohm W.W. 1/2W 20% Ins. Res.	.21	
63-1574	R13 - 1000 ohm 1W 20% Ins. Res.	.24	
63-1786	R5 - 1000 ohm 1/2W 20% Ins. Res.	.21	
63-1782	R8 - 820 ohm 1/2W 10% Ins. Res.	.21	
63-1821	R11 - 6800 ohm 1/2W 20% Ins. Res.	.21	
63-1828	R2 - 10K ohm 1/2W 20% Ins. Res.	.21	(2 used)
63-1842	R17 - 22K ohm 1/2W 20% Ins. Res.	.21	
63-1856	R15 - 47K ohm 1/2W 20% Ins. Res.	.21	(2 used)
63-1898	R9 - 470K ohm 1/2W 20% Ins. Res.	.21	(2 used)
63-1926	R3 - 2.2 Megohm 1/2W 20% Ins. Res.	.21	(3 used)
63-1940	R7 - 4.7 Megohm 1/2W 20% Ins. Res.	.21	
63-1961	R1 - 15 Megohm 1/2W 20% Ins. Res.	.21	
63-1977	R12 - 150 ohm 1W 10% Ins. Res.	.24	
63-2045	R10 - Tone Control	1.20	
63-2046	R6 - Volume Control & Switch	1.81	

Miscellaneous

11-104	Line Cord & Plug - 7 ft. long	.65
26-437	Dial Scale	1.76
46-811	Tuning, Volume & Tone Control Knob (3 used)	.40
46-844	Radio-Phono Switch Knob	.45
49-669	SP-1-5 1/4" PM Speaker	6.00
	TS-2025 Output Transformer	1.97
	ZC-5091 Cone	1.73
52-538	Two Prong Receptacle & Cable	.35
54-139	3/8-32 x 9/16" Palnut (1 ea. used on 85-465, 63-2045 & 63-2046)	.01
57-1626	Chassis Cover Plate	1.50
59-250	Dial Pointer	.70
70-117	#6 x 5/16" Phill. R.H.W.S. Steel Stat. Br. (8 used to Mt. 57-1626)	.01

Miscellaneous (Con't)

126-624	Heat Shield	.05
139-71	Speaker Baffle (Rubber)	.40
171-12	Pilot Light Lens	.10
188-32	Retaining Ring (used on 76-556)	1.03C
S-15708	Cobra Tone Arm Cartridge Assembly	3.50
S-15903	Dial Cord Assembly (Short)	.05
S-15904	Dial Cord Assembly (Long)	.06
S-16028	Pulley & Bushing Assembly	.25
S-16029	Bracket & Stud Assembly	.15
S-16419	Record Adapter Plug & Envelope Assembly	.60

Cabinet Parts Model H665Z & H665RZ

14-1265	Cabinet for H665Z - Radio-Phono Table Model	
14-1265R	Cabinet for H665RZ - Radio-Phono Table Model	
16-639	Packing Carton	
74-62	Speaker Screen	1.10
114-251	#10-32 x 5/8" Hex. Washer Hd. Sl. M.S. (4 used chassis mtg.)	.03
114-291	#8-32 x 7/16" Hex. Hd. Sl. M.S. Steel (2 used on S-16029)	.85C
139-90	Speaker Baffle (Duron)	.35
166-41	Rubber Bumper (used on gang)	.03
202-839	Instruction Book (Radio & Phono)	.25
S-14027	3 Speed Record Changer	
S-17211	L1-Wavemagnet Assembly	1.25

Cabinet Parts Model H665 & H665R

14-1241	Cabinet for H665 Radio-Phono Table Model	
14-1241R	Cabinet for H665R Radio-Phono	
16-639	Packing Carton	
19-123	Record Changer Mtg. Clip (4 used)	.10
57-1481	Clamping Strip (2 used)	.02
70-83	#6 x 1/2" Rd. Washer Hd. Wood St. Br. (6 used on Wavemagnet & 1 used 83-1671)	.55C
72-87	#6 x 5/8" Phil. F.H.W.S. Stat. Br. (8 used on dial scale mtg.)	.02
72-91	#6 x 7/16" Phill. F.H.W.S. (1 used on each 57-1481)	.02
74-62	Speaker Screen	1.10
80-407	Record Changer Mtg. Spring (4 used)	.02
83-1671	Wavemagnet Terminal Strip	.15
83-1737	Speaker Screen Retaining Strip	.10
112-544	Record Changer Mtg. Screw (3 used)	.11
114-40	#10-32 x 7/8" Hex. Washer Hd. (4 used chassis Mtg.)	.72C
139-90	Speaker Baffle (Duron)	.35
166-46	Bumper (4 used)	.03
202-833	Instruction Book	.15
S-14031	Variable Speed Record Changer	
S-17211	L1-Wavemagnet Assembly (or S-17314)	1.25

Cabinet Parts Model H661E & H661R

14-1281E	Cabinet for H661E Radio-Phono Table Model	
14-1281R	Cabinet for H661R Radio-Phono Table Model	
16-667	Packing Carton	

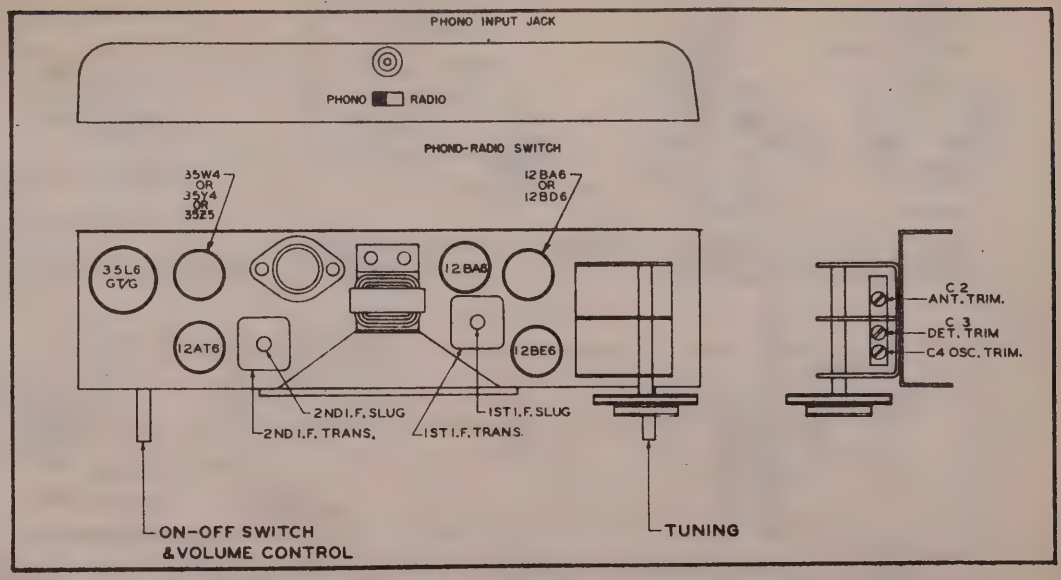
PARTS LIST

PART NO.	DIAG. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-452		Dial Scale	1.70
59-252		Dial Pointer	.30
59-253		Dial Pointer (Used on W & Y models only)	.30
76-519		Tuning Shaft	.20
78-882		Dial Light Socket & Wire	.35
80-69		Dial Cord Tension Spring	.05
80-209		Dial Cord Tension Spring	.03
100-67	PL1	Dial Light Bulb	.10
171-12		Pilot Light Lens	.10
188-32		Retaining Ring (Used on 76-519)	1.03C
188-54		Clamping Ring (Used on Dial Pointer)	.02
188-60		Retaining Ring (Used on S-14867)	.02
S-14834		Dial Cord & Eyelet Assem. (Short)	.05
S-14867		Pointer Pulley & Bushing Assem.	.25
S-14868		Brkt. & Stud Assem.	.15
S-16593		Dial Cord & Eyelet Assm. (Long)	.07
		Coils & Chokes	
95-1101	T1	1st. I.F. Transformer	1.60
95-1102	T2	2nd I.F. Transformer	1.60
S-14832	L2	Detector Coil Assem.	1.10
S-14833	L3	Oscillator Coil Assem.	1.10
		Condensers	
22-3	C16	.01 Mfd. 500V	
22-178	C11	.05 Mfd. 200V	.20
22-448	C17	.004 Mfd. 600V	
22-829	C5	.05 Mfd. 200V	.20
22-854	C18	.0005 Mfd. 600V	
22-1017	C13	.05 Mfd. 400V	.20
22-1182	C12	.01 Mfd. 400V	.20
22-1808	C14,C15	Elec. Cond. 80-40 Mfd. 150V	2.20
22-2158	C1	Three Section Gang Cond.	3.30
105-14	U1	Multiple Capacitor Unit (or 105-28)	.75
		Resistors	
63-1219	R14	22 Ohm W.W. 1/2W 20% Ins. Res.	.21
63-1574	R13	1000 Ohm 1 W 20% " "	.24
63-1664	R9	Volume Control & Switch	1.81
63-1744	R5	100 Ohm 1/2W 20% Ins. Res.	.21
63-1765	R1	330 Ohm 1/2W 20% " "	.21
63-1786	R3	1000 Ohm 1/2W 20% " "	.21
63-1800	R15	2200 Ohm 1/2W 20% " "	.21
63-1814	R8	4700 Ohm 1/2W 20% " "	.21
63-1828	R2	10K Ohm 1/2W 20% " "	.21
63-1842	R4	22K Ohm 1/2W 20% " "	.21
63-1898	R11	470K Ohm 1/2W 20% " " (2 used)	.21
63-1912	R7	1 Megohm 1/2W 20% " "	.21
63-1926	R6	2.2 Megohm 1/2W 20% " "	.21
63-1940	R10	4.7 Megohm 1/2W 20% " "	.21
63-1977	R12	150 Ohm 1 W 10% " "	.24
		Miscellaneous	
11-85		Line Cord & Plug	.65
14-1320		Plastic Cabinet for H615Z	
14-1321		Plastic Cabinet for H615WZ	
14-1322		Plastic Cabinet for H615YZ	
16-660		Packing Carton	
44-25		Phono Jack	.12
46-745		Tuning & Vol. Control Knob (2 used)	.15
46-745Y		Tuning & Vol. Control Knob (2 used) (W & Y Model only)	.15
49-643	SP1	5-1/4" PM Speaker	8.25
		TS-2035 Output Transformer	1.40
		ZC-5091 Cone & Voice Coil	1.73
54-129		Speed Nut (10 used on mtg. dial scale & gasket)	.60C
54-139		#3/8-32 x 9/16" Palnut Type N Cad. (used on 63-1664)	.09
54-267		#6-32 x 5/16" Palnut (1 ea. used on 95-1101 & 95-1102)	.45C
57-1688		Cabinet Front Plate	1.10
78-275		Elect. Cond. Socket	.03
78-596		Loktal Tube Socket (used only when 35Y4 is used)	.18
78-611		Octal Tube Socket	.12
78-801		Octal Tube Socket (used only when 35Z5GT is used)	.15
78-807		Miniature Tube Socket (4 used)	.15
78-810		Miniature Tube Socket (used only when 35W4 is used)	.15
83-1833		Rubber Strip (used with Dial Scale)	.02
85-495	S1	Phono-Radio Switch	
94-334		Gang Cond. Mtg. Bushing (3 used)	.67C
110-155		Grill Cloth	.10
110-156		Grill Cloth (used on W&Y Model only)	.10
114-192		#6 x 7/16" Hex. Hd. S.T.(2 used on Chassis Mtg.)	.84C
139-92		Baffle Board	.30
139-95		Speaker Baffle (Rubber)	.05
159-69		Trimount Stud-St.Br.(4 used on Wavemagnet)	.01
166-41		Rubber Bumper(or 166-44) (used on Gang Cond)	.03
188-136		Trim Ring	.20
196-154		Grill Cloth Support Gasket	.03
202-886		Instruction Book	
S-18134		Wavemagnet Assem.	

Prices shown are suggested list prices, and are subject to change without notice.

ZENITH RADIO CORPORATION 2/15/51

MODEL H615Z CHASSIS 6G05



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

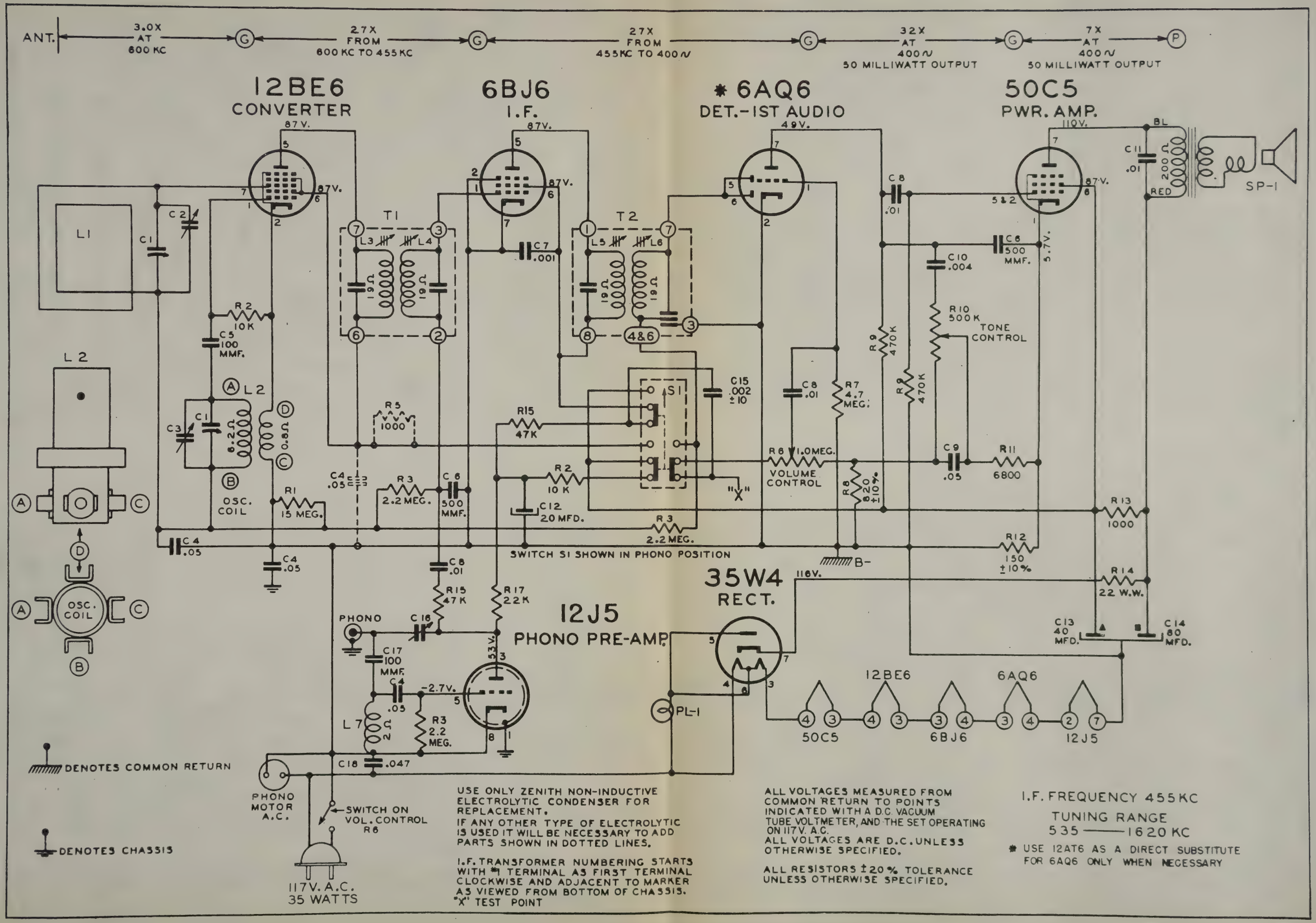
TO THE SERVICEMAN

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I.F. Alignment
2	Single Turn Loosely Coupled to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-3	Detector Alignment
4		--	1400 Kc.	1400 Kc.	C-2	Antenna Alignment

MODELS H665, H665R, H665Z, H665RZ, H661E & H661R
CHASSIS 6H01


ANT.
3.0X AT 600 KC
27X FROM 600 KC TO 455 KC
27X FROM 455 KC TO 400 ~
32X AT 400 ~ 50 MILLIWATT OUTPUT
7X AT 400 ~ 50 MILLIWATT OUTPUT
12BE6 CONVERTER
6BJ6 I.F.
* 6AQ6 DET.-1ST AUDIO
50C5 PWR. AMP.
35W4 RECT.
12J5 PHONO PRE-AMP.
L1
L2
OSC. COIL
T1
T2
L3 L4 L5 L6
L7
S1
SP-1
PL-1
PHONO
PHONO MOTOR A.C.
SWITCH ON VOL. CONTROL R6
117V. A.C. 35 WATTS
TONE CONTROL
VOLUME CONTROL
"X"
SWITCH S1 SHOWN IN PHONO POSITION
B-
DENOTES COMMON RETURN
DENOTES CHASSIS
USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT.
IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.
I.F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL AS FIRST TERMINAL CLOCKWISE AND ADJACENT TO MARKER AS VIEWED FROM BOTTOM OF CHASSIS.
"X" TEST POINT
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER, AND THE SET OPERATING ON 117V. A.C.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY 455 KC
TUNING RANGE 535 —— 1620 KC
* USE 12AT6 AS A DIRECT SUBSTITUTE FOR 6AQ6 ONLY WHEN NECESSARY

76-556	Tuning Control Shaft	.15
78-229	Elect. Cond. Socket	.03
78-644	Phono Connector Socket	.12
78-709	Octal Tube Socket	.20
78-806	Miniature Tube Socket (2 used)	.15
78-807	Miniature Tube Socket (3 used)	.15
78-808	Pilot Light Socket & Wire	.45
80-69	Dial Cord Tension Spring	.05
80-209	Dial Cord Tension Spring	.03
85-465	S1-Phono-Radio Switch (or 85-466)	1.00
93-138	Felt Washer (used on S-16029)	.01
93-392	3/32 x 33/64 x 1" Brown Felt Washer (4 used on Knobs)	1.20C
94-295	Gang Mtg. Bushing	.04
100-67	PL-1-Dial Light Bulb	.11
114-297	#6 x 1/4" Hex. Hd. Sl. S.T. (2 used on 126-624)	.01
19-123	Record Changer Mtg. Clip (4 used)	.10
70-83	#6 x 1/2" Rd. Washer Hd. Wood Screw St. Br. (6 used to mt. S-17476)	.55C
72-87	#6 x 5/8 Phill. F.H.W.S. St. Br. (8 used to mt. Dial Scale & Baffle)	.02
80-407	Record Changer Mtg. Spring (4 used)	.02
83-1737	Speaker Screen Retaining Strip (4 used)	.10
112-544	Record Changer Mtg. Screw (3 used)	.11
114-40	#10-32 x 7/8" Hex. Washer Hd. Sl. (4 used chassis mtg.)	.72C
139-94	Speaker Baffle & Grille Cloth	2.00
166-46	Bumper (4 used)	.03
202-833	Instruction Book (Radio & Phono)	.15
S-14031	Variable Speed Record Changer	
S-17475	L1-Wavemagnet Assembly H661R	1.25
S-17476	L1-Wavemagnet Assembly	1.25

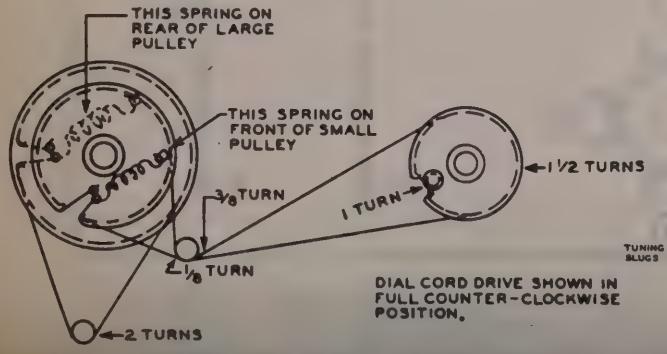
Prices subject to change without notice.

TO THE SERVICEMAN:

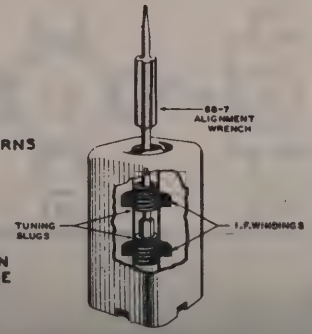
The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

In the event the receiver oscillates during phono operation, adjust C16 4-80 mmf. capacitor to a point at which the oscillation ceases.

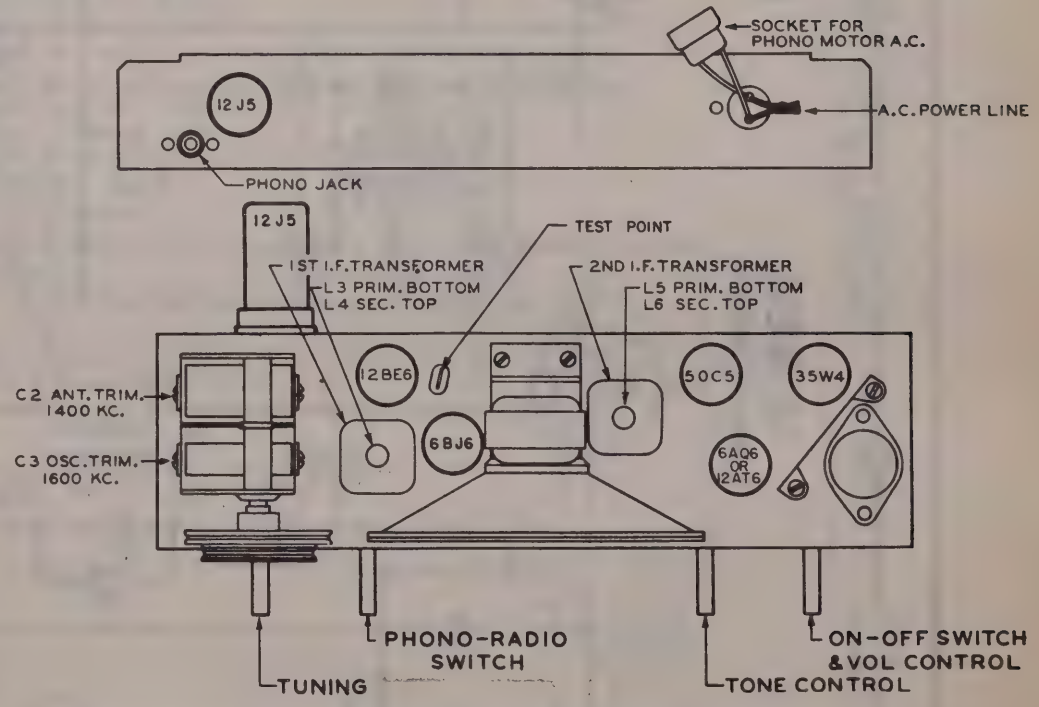
This position of no oscillation will sometimes vary with different cartridges, and in this case readjustment of C16 must be made.


THIS SPRING ON REAR OF LARGE PULLEY
THIS SPRING ON FRONT OF SMALL PULLEY
1½ TURNS
⅜ TURN
1 TURN
1⅛ TURN
2 TURNS
DIAL CORD DRIVE SHOWN IN FULL COUNTER-CLOCKWISE POSITION.

DIAL CABLE DRAWING AND DETAIL OF I.F. TRANSFORMER



Detail of IF Transformer



TUBE AND TRIMMER LOCATION

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3, 4, 5, 6	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

TO THE SERVICE MAN:

The 7H04 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7H04 or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

The IF transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

MODELS H665, H665R, H665Z, H665RZ, H661E & H661R
CHASSIS 6H01

Coils & Chokes

95-1101	T1 - 1st. I.F. Transformer	1.60
95-1102	T2 - 2nd. I.F. Transformer	1.60
S-12603	L7 - Phono Oscillator Coil Assembly	.75
S-13799	L2 - Oscillator Coil Assembly	.75

Condensers

22-3	C8 - .01 Mfd. Ceramic (Disc.) 500V (3 used)	.26	
22-4	C10 - .004 Mfd. Ceramic (Disc.) 500V	.26	
22-5	C5 - 110 Mmfd. Ceramic (Disc.) (or 22-162) 500V	.26	
22-178	C9 - .05 Mfd. 200V	.20	
22-829	C4 - .05 Mfd. 200V (3 used)	.20	
22-854	C6 - .0005 Mfd. 600V (2 used)	.20	
22-1182	C11 - .01 Mfd. 400V	.20	
22-1444	C7 - .001 Mfd. 200V	.20	
22-1701	C17 - 100 Mmfd. Ceramic 500V	.20	
22-1775	C18 - .047 Mfd. 400V	.26	
22-2085	C1 - Variable - 2 gang	3.00	
22-2272	C12,13,14 Elect. - 20 Mfd. 150V x 40 Mfd. 150V x 80 Mfd. - 150V	2.50	
22-2241	C15 - .002 Mfd. Ceramic 500V	.35	
22-2242	C16 - Trimmer Capacitor	.40	

Resistors

63-1219	R14-22 ohm W.W.	1/2W	20%	Ins. Res.	.21	
63-1574	R13-1000 ohm	1W	20%	Ins. Res.	.24	
63-1786	R5 - 1000 ohm	1/2W	20%	Ins. Res.	.21	
63-1782	R8 - 820 ohm	1/2W	10%	Ins. Res.	.21	
63-1821	R11-6800 ohm	1/2W	20%	Ins. Res.	.21	
63-1828	R2 - 10K ohm	1/2W	20%	Ins. Res.	.21	(2 used)
63-1842	R17-22K ohm	1/2W	20%	Ins. Res.	.21	
63-1856	R15-47K ohm	1/2W	20%	Ins. Res.	.21	(2 used)
63-1898	R9 - 470K ohm	1/2W	20%	Ins. Res.	.21	(2 used)
63-1926	R3 - 2.2 Megohm	1/2W	20%	Ins. Res.	.21	(3 used)
63-1940	R7 - 4.7 Megohm	1/2W	20%	Ins. Res.	.21	
63-1961	R1 - 15 Megohm	1/2W	20%	Ins. Res.	.21	
63-1977	R12-150 ohm	1W	10%	Ins. Res.	.24	
63-2045	R10-Tone Control				1.20	
63-2046	R6 - Volume Control & Switch				1.81	

Miscellaneous

11-104	Line Cord & Plug - 7 ft. long	.65
26-437	Dial Scale	1.76
46-811	Tuning, Volume & Tone Control Knob (3 used)	.40
46-844	Radio-Phono Switch Knob	.45
49-669	SP-1-5 1/4" PM Speaker	6.00
	TS-2025 Output Transformer	1.97
	ZC-5091 Cone	1.73
52-538	Two Prong Receptacle & Cable	.35
54-139	3/8-32 x 9/16" Palnut (1 ea. used on 85-465, 63-2045 & 63-2046)	.01
57-1626	Chassis Cover Plate	1.50
59-250	Dial Pointer	.70
70-117	#6 x 5/16" Phill. R.H.W.S. Steel Stat. Br. (8 used to Mt. 57-1626)	.01
76-556	Tuning Control Shaft	.15
78-229	Elect. Cond. Socket	.03
78-644	Phono Connector Socket	.12
78-709	Octal Tube Socket	.20
78-806	Miniature Tube Socket (2 used)	.15
78-807	Miniature Tube Socket (3 used)	.15
78-808	Pilot Light Socket & Wire	.45
80-69	Dial Cord Tension Spring	.05
80-209	Dial Cord Tension Spring	.03
85-465	S1-Phono-Radio Switch (or 85-466)	1.00
93-138	Felt Washer (used on S-16029)	.01
93-392	3/32 x 33/64 x 1" Brown Felt Washer (4 used on Knobs)	1.20C
94-295	Gang Mtg. Bushing	.04
100-67	PL-1-Dial Light Bulb	.11
114-297	#6 x 1/4" Hex. Hd. Sl. S.T. (2 used on 126-624)	.01

Miscellaneous (Con't)

126-624	Heat Shield	.05
139-71	Speaker Baffle (Rubber)	.40
171-12	Pilot Light Lens	.10
188-32	Retaining Ring (used on 76-556)	1.03C
S-15708	Cobra Tone Arm Cartridge Assembly	3.50
S-15903	Dial Cord Assembly (Short)	.05
S-15904	Dial Cord Assembly (Long)	.06
S-16028	Pulley & Bushing Assembly	.25
S-16029	Bracket & Stud Assembly	.15
S-16419	Record Adapter Plug & Envelope Assembly	.60

Cabinet Parts Model H665Z & H665RZ

14-1265	Cabinet for H665Z - Radio-Phono Table Model	
14-1265R	Cabinet for H665RZ - Radio-Phono Table Model	
16-639	Packing Carton	
74-62	Speaker Screen	1.10
114-251	#10-32 x 5/8" Hex. Washer Hd. Sl. M.S. (4 used chassis mtg.)	.03
114-291	#8-32 x 7/16" Hex. Hd. Sl. M.S. Steel (2 used on S-16029)	.85C
139-90	Speaker Baffle (Duron)	.35
166-41	Rubber Bumper (used on gang)	.03
202-839	Instruction Book (Radio & Phono)	.25
S-14027	3 Speed Record Changer	
S-17211	L1-Wavemagnet Assembly	1.25

Cabinet Parts Model H665 & H665R

14-1241	Cabinet for H665 Radio-Phono Table Model	
14-1241R	Cabinet for H665R Radio-Phono	
16-639	Packing Carton	
19-123	Record Changer Mtg. Clip (4 used)	.10
57-1481	Clamping Strip (2 used)	.02
70-83	#6 x 1/2" Rd. Washer Hd. Wood St. Br. (6 used on Wavemagnet & 1 used 83-1671)	.55C
72-87	#6 x 5/8" Phil. F.H.W.S. Stat. Br. (8 used on dial scale mtg.)	.02
72-91	#6 x 7/16" Phill. F.H.W.S. (1 used on each 57-1481)	.02
74-62	Speaker Screen	1.10
80-407	Record Changer Mtg. Spring (4 used)	.02
83-1671	Wavemagnet Terminal Strip	.15
83-1737	Speaker Screen Retaining Strip	.10
112-544	Record Changer Mtg. Screw (3 used)	.11
114-40	#10-32 x 7/8" Hex. Washer Hd. (4 used chassis Mtg.)	.72C
139-90	Speaker Baffle (Duron)	.35
166-46	Bumper (4 used)	.03
202-833	Instruction Book	.15
S-14031	Variable Speed Record Changer	
S-17211	L1-Wavemagnet Assembly (or S-17314)	1.25

Cabinet Parts Model H661E & H661R

14-1281E	Cabinet for H661E Radio-Phono Table Model	
14-1281R	Cabinet for H661R Radio-Phono Table Model	
16-667	Packing Carton	
19-123	Record Changer Mtg. Clip (4 used)	.10
70-83	#6 x 1/2" Rd. Washer Hd. Wood Screw St. Br. (6 used to mt. S-17476)	.55C
72-87	#6 x 5/8 Phill. F.H.W.S. St. Br. (8 used to mt. Dial Scale & Baffle)	.02
80-407	Record Changer Mtg. Spring (4 used)	.02
83-1737	Speaker Screen Retaining Strip (4 used)	.10
112-544	Record Changer Mtg. Screw (3 used)	.11
114-40	#10-32 x 7/8" Hex. Washer Hd. Sl. (4 used chassis mtg.)	.72C
139-94	Speaker Baffle & Grille Cloth	2.00
166-46	Bumper (4 used)	.03
202-833	Instruction Book (Radio & Phono)	.15
S-14031	Variable Speed Record Changer	
S-17475	L1-Wavemagnet Assembly H661R	1.25
S-17476	L1-Wavemagnet Assembly	1.25

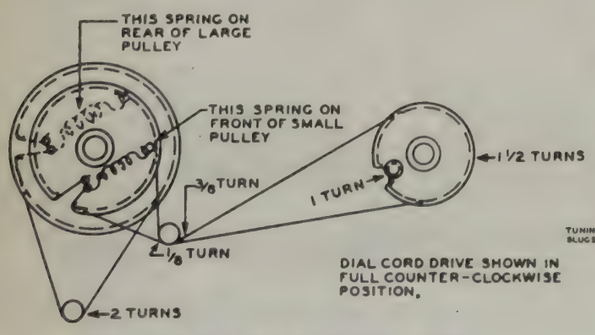
Prices subject to change without notice.

TO THE SERVICEMAN:

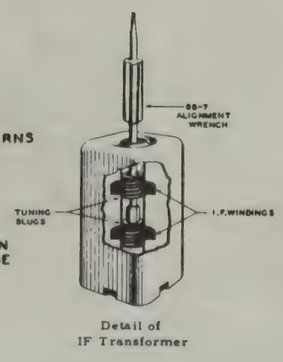
The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

In the event the receiver oscillates during phono operation, adjust C16 4-80 mmf. capacitor to a point at which the oscillation ceases.

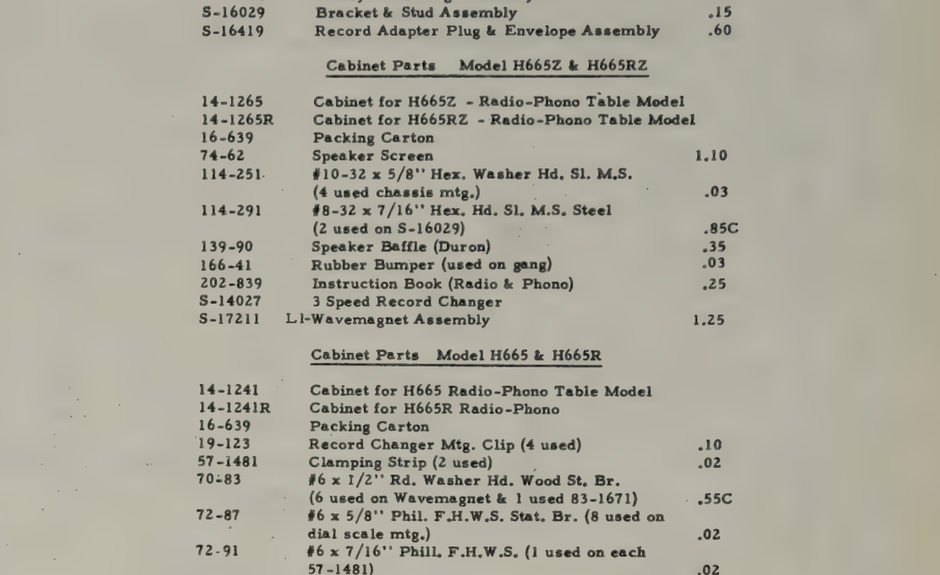
This position of no oscillation will sometimes vary with different cartridges, and in this case readjustment of C16 must be made.


THIS SPRING ON REAR OF LARGE PULLEY
THIS SPRING ON FRONT OF SMALL PULLEY
1 1/2 TURNS
3/8 TURN
1 TURN
1/8 TURN
2 TURNS
DIAL CORD DRIVE SHOWN IN FULL COUNTER-CLOCKWISE POSITION.

DIAL CABLE DRAWING AND DETAIL OF I.F. TRANSFORMER



Detail of IF Transformer

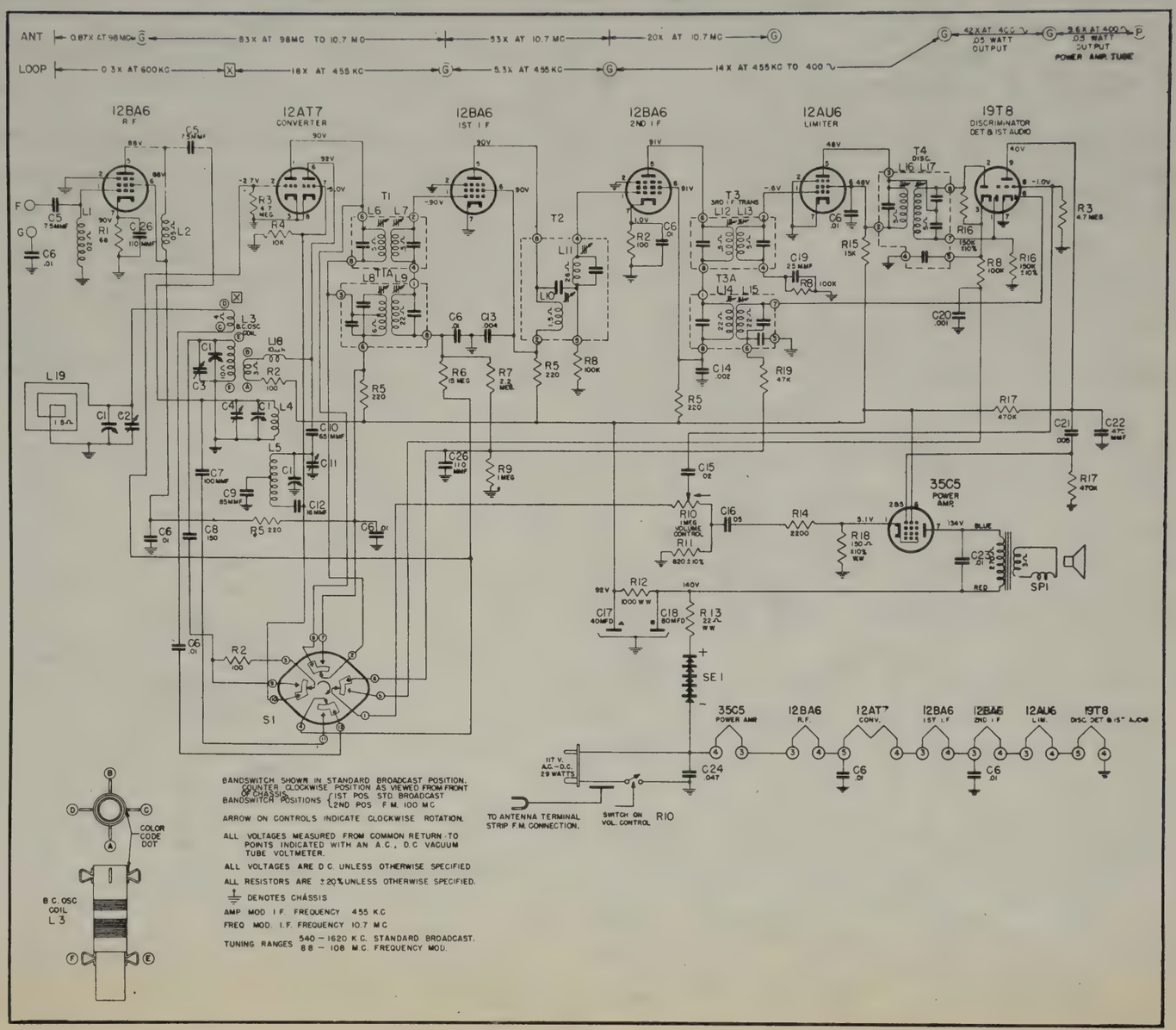


TUBE AND TRIMMER LOCATION

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3, 4, 5, 6	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

MODEL H723
CHASSIS 7HO4


ANT
LOOP
12BA6 R.F.
12AT7 CONVERTER
12BA6 1ST I.F.
12BA6 2ND I.F.
12AU6 LIMITER
19T8 DISCRIMINATOR DET. & 1ST AUDIO
35C5 POWER AMP.
SPI
S1
SE1
L19
T1
T2
T3
T3A
T4 DISC.
R10 1 MEG VOLUME CONTROL
R11 820 ± 10%
117 V. A.C.-D.C. 29 WATTS
TO ANTENNA TERMINAL STRIP F.M. CONNECTION.
SWITCH ON VOL. CONTROL R10
COLOR CODE DOT
B.C. OSC COIL L3
BANDSWITCH SHOWN IN STANDARD BROADCAST POSITION. COUNTER CLOCKWISE POSITION AS VIEWED FROM FRONT OF CHASSIS.
BANDSWITCH POSITIONS { 1ST POS. STD. BROADCAST / 2ND POS F.M. 100 MC
ARROW ON CONTROLS INDICATE CLOCKWISE ROTATION.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE ±20% UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
AMP MOD I.F. FREQUENCY 455 K.C.
FREQ MOD. I.F. FREQUENCY 10.7 M.C.
TUNING RANGES 540 — 1620 K.C. STANDARD BROADCAST. 88 — 108 M.C. FREQUENCY MOD.

PARTS LIST

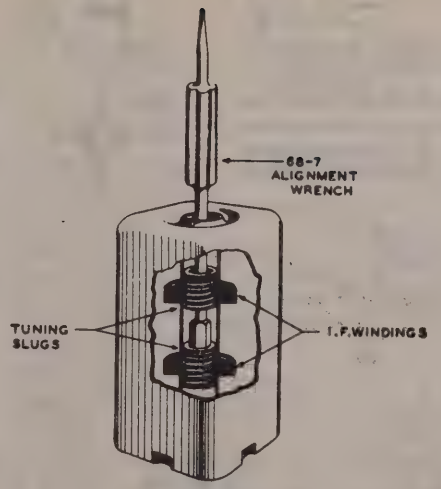
PART NO.	DESCRIPTION		PRICE
	DIAL ASSEMBLY		
46-859	Band Switch Knob		.15
46-860	Tuning Control Knob		.15
46-900	Volume Control Knob		.15
59-251	Dial Pointer		.70
80-69	Dial Cord Tension Spring		.05
188-129	Retaining Ring (1 ea. used S-17334 & S-17467)		.08
S-17334	Tuning Shaft & Pulley Assem.		.45
S-17336	Tuning Shaft Brkt. & Ins. Strip Assem.		.15
S-17350	Dial Cord & Eyelet Assem.		.07
S-17467	Pointer Shaft, Brkt. & Pulley Assem.		.60
	COILS & CHOKES		
20-329-L1	F.M. Antenna Coil		.15
20-330-L2	R.F. Plate Load Coil		.10
20-331-L4	F.M. Mixer Coil		
20-333-L18	R.F. Choke Coil		.25
95-1102-T3A	3rd I.F. Transformer	455 KC	1.60
95-1150-T1T3	1st & 3rd I.F. "	10.7 MC	1.50
95-1153-T4	Discriminator "	10.7 MC	1.50
95-1250-T1A	1st I.F. "	455 KC	1.60
95-1251-T2	2nd I.F. "	10.7 MC & 455KC	1.65
S-17340-L3	B.C. Osc. Coil Assem.		1.00
	CONDENSERS		
22-3-C6	.01 Mfd. Ceramic (disc) (9 Used)	500V	.26
22-5-C26	110 Mmfd. Ceramic (disc) (2 Used) (or 22-1669)	500V	.26
22-6-C22	470 Mmfd. Ceramic	500V	.26
22-229-C21	.005 Mfd.	600V	.20
22-448-C13	.004 Mfd.	600V	.20
22-830-C15	.02 Mfd.	600V	.20
22-1126-C23	.01 Mfd.	400V	.20
22-1158-C16	.05 Mfd.	200V	.20
22-1220-C14	.002 Mfd.	600V	.20
22-1507-C19	25 Mmfd. Ceramic	500V	.33
22-1669-C7	100 Mmfd. Ceramic	500V	.20
22-1675-C8	150 Mmfd. Ceramic	500V	.25
22-1676-C20	.001 Mfd. Ceramic	500V	.40

PART NO.	DESCRIPTION		PRICE
	CONDENSERS Cont'd.		
22-1757-C17,C18	Elect. 40 Mfd. 150V - 80 Mfd.		2.00
22-1775-C24	.047 Mfd.	400V	.26
22-1852-C5	7.5 Mmfd. Ceramic (2 Used)	500V	.35
22-2253-C11	Trimmer Cond. (Slug Tuned)		.60
22-2255-C1	Variable Gane (Two Sect. B.C. - Two Sect. FM)		5.50
22-2256-C10	65 MMfd. Ceramic	500V	.26
22-2257-C12	16 Mmfd. Ceramic	500V	.26
22-2258-C9	85 Mmfd. Ceramic	500V	.30
	RESISTORS		
63-686-R18	150 Ohm W.W. 1/2W 10% Ins. Res.		.21
63-1450-R13	22 Ohm W.W. 1W 20% Ins. Res.		.24
63-1527-R12	1000 Ohm W.W. 3W 20% Ins. Res.		.39
63-1737-R1	68 Ohm 1/2W 20% Ins. Res.		.21
63-1744-R2	100 Ohm 1/2W 20% Ins. Res.		.21
63-1758-R5	220 Ohm 1/2W 20% Ins. Res. (3 Used)		.21
63-1782-R11	820 Ohm 1/2W 10% Ins. Res.		.21
63-1800-R14	2200 Ohm 1/2W 20% Ins. Res.		.21
63-1828-R4	10K Ohm 1/2W 20% Ins. Res.		.21
63-1835-R15	15K Ohm 1/2W 20% Ins. Res.		.21
63-1856-R19	47K Ohm 1/2W 20% Ins. Res.		.21
63-1870-R8	100K Ohm 1/2W 20% Ins. Res. (3 Used)		.21
63-1876-R16	150K Ohm 1/2W 10% Ins. Res. (2 Used)		.21
63-1898-R17	470K Ohm 1/2W 20% Ins. Res. (2 Used)		.21
63-1912-R9	1 Megohm 1/2W 20% Ins. Res.		.21
63-1926-R7	2.2 Megohm 1/2W 20% Ins. Res.		.21
63-1940-R3	4.7 Megohm 1/2W 20% Ins. Res. (2 Used)		.21
63-1961-R6	15 Megohm 1/2W 20% Ins. Res.		.21
63-2143-R10	Vol. Control & Switch		1.81
	MISCELLANEOUS		
11-85	Line Cord & Plug (6 ft. lg.)		.65
12-1070	Wavemagnet Mtg. Brkt.		.25
14-1272	Plastic Cabinet for H723 Table Model		5.50

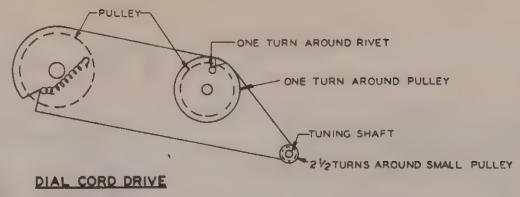
PART NO.	DESCRIPTION	PRICE
	MISCELLANEOUS Cont'd.	
16-656	Packing Carton	---
24-535	Line Cord Plug Cover	.10
49-689-SP1	5-1/4" PM Speaker ZC5091 Cone	6.00 1.73
54-129	Speed Nut (9 Used on Mtg. Grille & Baffle)	.60C
54-271	6-32 X 1/4" Palnut Steel (1 ea. used on I.F.)	.01
57-1686	Emblem Plate	.35
57-1690	Emblem Mtg. Plate	.01
58-188	Two Print Plug (AC)	.08
78-787	Two Contact Socket (Cabinet Back)	.10
78-806	Miniature Tube Socket	.15
78-807	Miniature Tube Socket	.15
78-869	Miniature Tube Socket	.20
78-870	Miniature Tube Socket (2 Used)	.15
78-871	Miniature Tube Socket	.15
78-903	Miniature Tube Socket	.30
83-1056	Wavemagnet Mtg. Strip	.03
83-1829	Insulator Strip	.07
85-493-S1	Band Switch	1.15
97-293	Chassis Mtg. Stud (2 Used)	.18
110-152	Grille Cloth	.10
112-281	#10 X 3/4" Oval Bind. Hd. S.T. Br. (2 Used Chassis Mtg.)	1.20C
114-78	#8 X 5/16 Hex. Hd. Sl. S.T. (Used on Mtg. Wavemagnet)	.01
114-356	#6-32 X 1-1/4" Hex. Hd. S.T. Cad. (Used on 212-7)	.02
138-42	Cabinet Grill	1.60
139-91	Speaker Baffle	.15
149-89	Iron Core (Used on S-17340)	.10
159-69	Plug Button (4 Used to mt. back)	.01
194-22	Insulator	.15
196-153	Speaker Gasket	.40
202-697	F.M. Instruction Book	.10
202-841	Instruction Book	.08
212-7-SE1	Selenium Rectifier	1.80
S-14527	Wavemagnet Lead & Stop Assem.	.20
S-17364-L19	Wavemagnet Assem.	1.00
S-17366	Cabinet Back Assem. (Complete)	1.50

Prices shown are suggested list prices and are subject to change without notice.

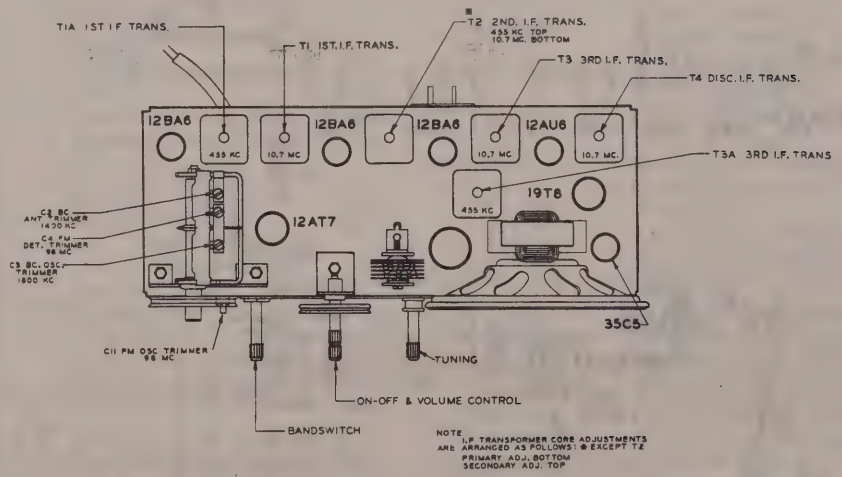
TUBE AND TRIMMER LOCATION



Detail of
IF Transformer



DIAL CORD DRIVE



ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2-12AT7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 11, 14, 15	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and 13 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C11 Osc. Coil.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C4 Det. Coil.	Align det. stage to maximum reading.

TO THE SERVICE MAN:

The 7H04Z chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band, There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7H04Z or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

The IF transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the others.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment; When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Note: If a 12AT7 is replaced with a 12AU7 or vice versa, the RF portion of this reciever must be realigned.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

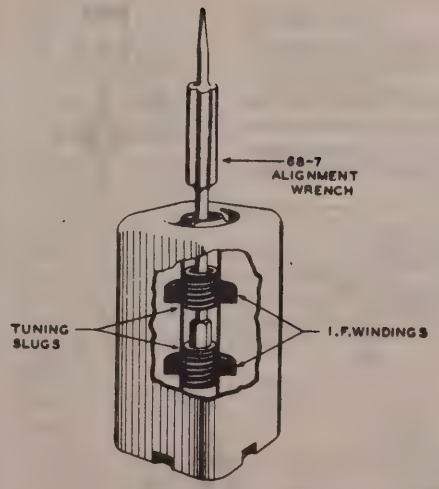
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

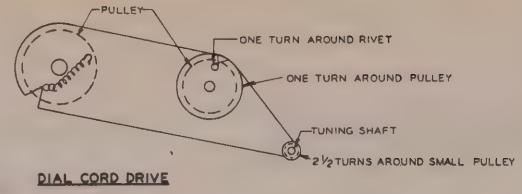
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

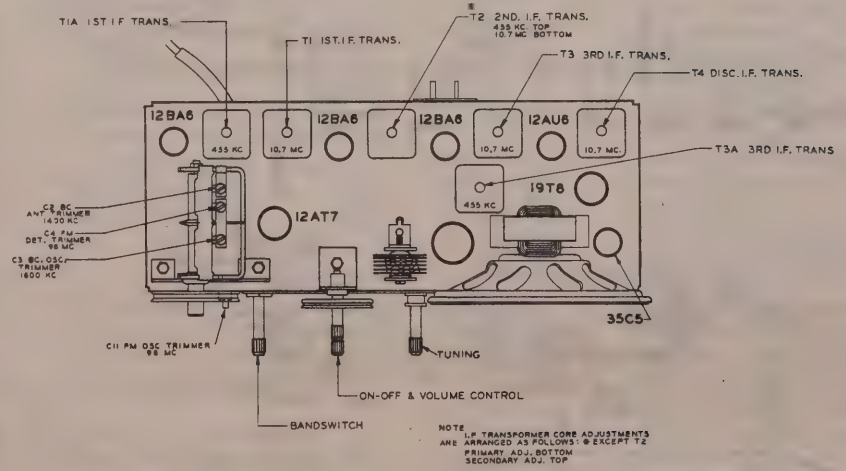
TUBE AND TRIMMER LOCATION



Detail of
IF Transformer



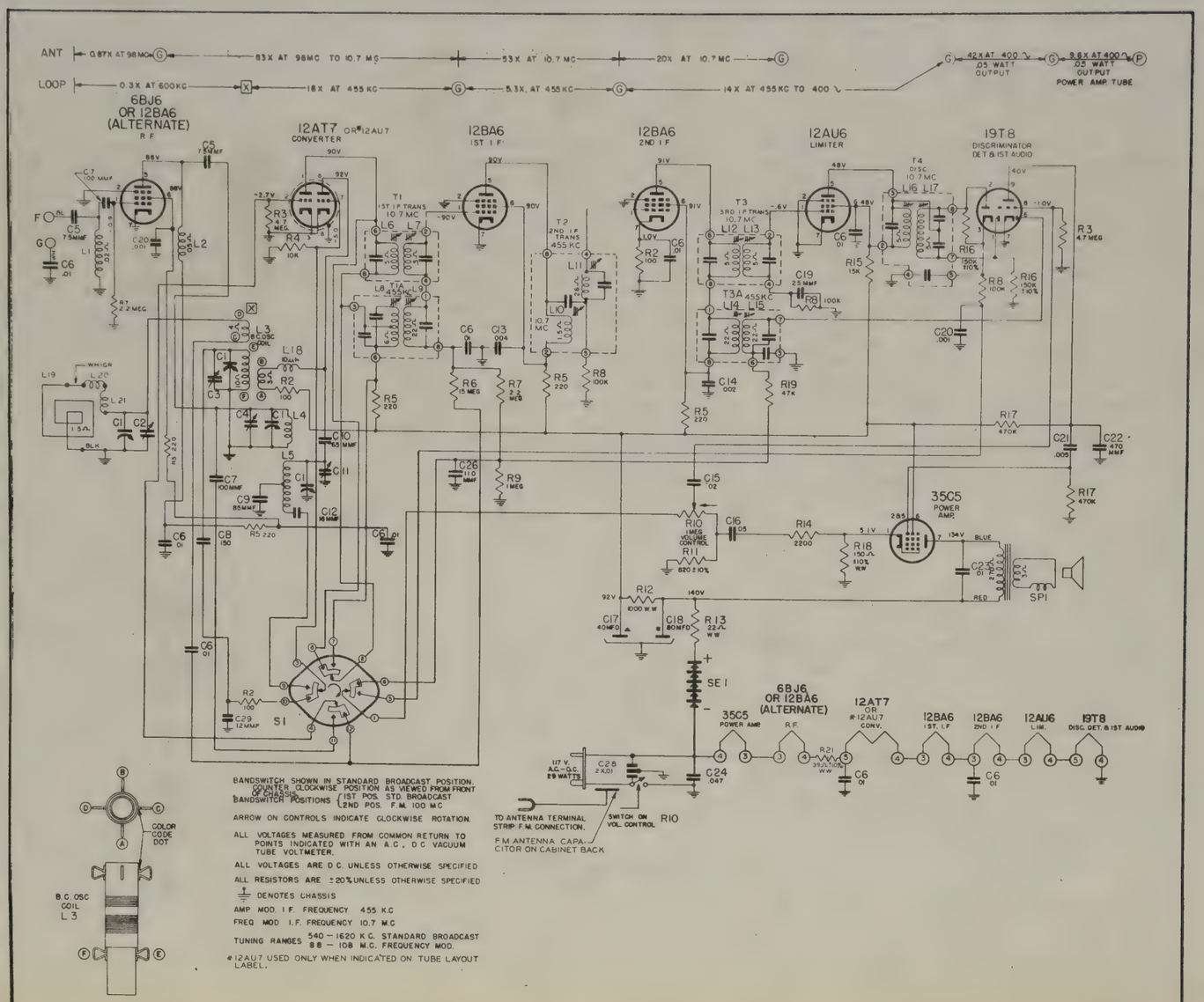
DIAL CORD DRIVE



ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2-12AT7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 11, 14, 15	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and 13 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C11 Osc. Coil.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C4 Det. Coil.	Align det. stage to maximum reading.

MODEL H723Z
CHASSIS 7H04Z

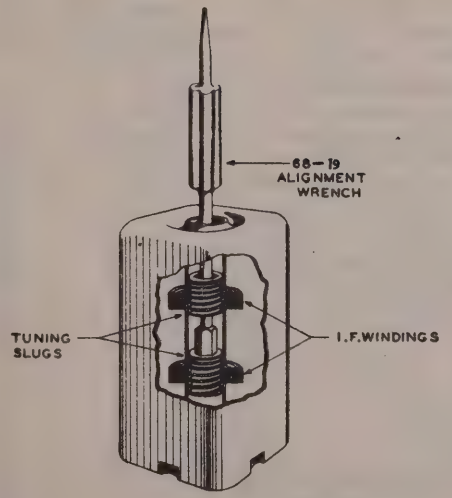

ANT
0.87X AT 98 MC
83X AT 98MC TO 10.7 MC
93X AT 10.7 MC
20X AT 10.7 MC
LOOP
0.3X AT 600KC
18X AT 455 KC
5.3X AT 455 KC
14X AT 455KC TO 400 ~
42X AT 400 ~ .05 WATT OUTPUT
9.6X AT 400 ~ .05 WATT OUTPUT POWER AMP. TUBE
6BJ6 OR 12BA6 (ALTERNATE) R.F.
12AT7 OR *12AU7 CONVERTER
12BA6 1ST I.F.
12BA6 2ND I.F.
12AU6 LIMITER
19T8 DISCRIMINATOR DET. & 1ST AUDIO
T1 1ST I.F. TRANS 10.7 MC
T2 2ND I.F. TRANS 455 KC
T3 3RD I.F. TRANS 10.7 MC
T3A 455KC
T4 DISC 10.7 MC
35C5 POWER AMP.
SP1
S1
SE1
6BJ6 OR 12BA6 (ALTERNATE)
12AT7 OR *12AU7 CONV.
117 V. A.C.-D.C. 25 WATTS
TO ANTENNA TERMINAL STRIP F.M. CONNECTION.
F.M. ANTENNA CAPACITOR ON CABINET BACK
SWITCH ON VOL. CONTROL R10
COLOR CODE DOT
B.C. OSC COIL L3
BANDSWITCH SHOWN IN STANDARD BROADCAST POSITION. COUNTER CLOCKWISE POSITION AS VIEWED FROM FRONT OF CHASSIS.
BANDSWITCH POSITIONS (1ST POS. STD. BROADCAST 2ND POS. F.M. 100 MC
ARROW ON CONTROLS INDICATE CLOCKWISE ROTATION.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED
ALL RESISTORS ARE ±20% UNLESS OTHERWISE SPECIFIED
DENOTES CHASSIS
AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7 M.C.
TUNING RANGES 540 – 1620 K.C. STANDARD BROADCAST 88 – 108 M.C. FREQUENCY MOD.
*12AU7 USED ONLY WHEN INDICATED ON TUBE LAYOUT LABEL.

PARTS LIST

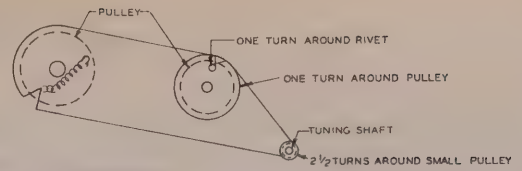
PART NO.	DIAG. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
46-859		Band Switch Knob	.15
46-860		Tuning Control Knob	.15
46-900		Volume Control Knob	.15
59-251		Dial Pointer	.70
80-69		Dial Cord Tension Spring	.05
188-129		Retaining Ring	.08
S-17334		Tuning Shaft & Pulley Assem.	.45
S-17336		Tuning Shaft Brkt. & Ins. Strip Assem.	.15
S-17350		Dial Cord & Eyelet Assem.	.07
S-17467		Brkt. & Pulley Assem.	.60
		COILS & CHOKES	
20-328	L5	F.M. Osc. Coil	.10
20-331	L4	F.M. Mixer "	.05
20-333	L18	R.F. Choke "	.25
20-335	L2	R.F. Plate Load Coil	.20
20-336	L1	F.M. Antenna Coil	.15
95-1102	T3A	3rd. I.F. Trans. 455KC	1.60
95-1150	T3	1st. & 3rd. I.F. Trans. 10.7 MC (2 Used)	1.50
95-1153	T4	Disc. Trans. 10.7 MC	1.50
95-1250	T1A	1st. I.F. Trans. 455KC	1.60
95-1251	T2	2nd. I.F. Trans. 10.7 MC & 455 KC	1.65
S-17340	L3	B.C. Osc. Coil Assem.	1.00
		CONDENSERS	
22-3	C6	.01 Mfd. Ceramic Disc. (9 Used) 500V	.26
22-5	C26	110 Mmfd. " " (or 22-1669) 500V	.26
22-6	C22	470 Mmfd. Ceramic 500V	.26
22-229	C21	.005 Mfd. 600V	.20
22-448	C13	.004 " 600V	.20
22-830	C15	.02 " 600V	.20
22-1126	C23	.01 " 400V	.20
22-1158	C16	.05 " 200V	.20
22-1220	C14	.002 " 600V	.20
22-1507	C19	25 Mmfd. Ceramic 500V	.33
22-1669	C7	100 " " (2 Used) 500V	.20
22-1675	C8	150 " " 500V	.25
22-1676	C20	.001 Mfd. " (2 Used) 500V	.40
22-1757	C18,C17	Elect. Cond. 40 Mfd. - 150V - 80 Mfd. 150V	2.00
		CONDENSERS Cont'd.	
22-1775	C24	.047 Mfd. 400V	.26
22-1852	C5	7.5 Mmfd. Ceramic (2 Used) 500V	.35
22-2253	C11	Trimmer Cond. (Slug Tuned)	.60
22-2255	C1	Variable Gang Two Sect. B.C. Two Section F.M.	5.50
22-2256	C10	65 Mmfd. Ceramic 500V	.26
22-2257	C12	16 Mmfd. Ceramic 500V	.26
22-2258	C9	85 Mmfd. Ceramic 500V	.30
22-2276	C28	Dual Ceramic - .01 Mfd. 500V	.50
22-2278	C29	12 Mmfd. Ceramic 500V	.30
		RESISTORS	
63-686	R18	150 Ohm W.W. 1/2W 10% Ins. Res.	.21
63-1450	R13	22 Ohm W.W. 1W 20% Ins. Res.	.24
63-1527	R12	1000 Ohm W.W. 3W 20% Ins. Res.	.39
63-1744	R2	100 Ohm 1/2W 20% Ins. Res. (3 Used)	.21
63-1758	R5	220 Ohm 1/2W 20% Ins. Res. (5 Used)	.21
63-1782	R11	820 Ohm 1/2W 10% Ins. Res.	.21
63-1800	R14	2200 Ohm 1/2W 20% Ins. Res.	.21
63-1828	R4	10K Ohm 1/2W 20% Ins. Res.	.21
63-1835	R15	15K Ohm 1/2W 20% Ins. Res.	.21
63-1856	R19	47K Ohm 1/2W 20% Ins. Res.	.21
63-1870	R8	100K Ohm 1/2W 20% Ins. Res. (3 Used)	.21
63-1876	R16	150K Ohm 1/2W 10% Ins Res. (2 Used)	.21
63-1898	R17	470K Ohm 1/2W 20% Ins. Res. (2 Used)	.21
63-1912	R9	1 Megohm 1/2W 20% Ins. Res.	.21
63-1926	R7	2.2 Megohm 1/2W 20% Ins. Res. (2 Used)	.21
63-1940	R3	4.7 Megohm 1/2W 20% Ins. Res. (2 Used)	.21
63-1961	R6	15 Megohm 1/2W 20% Ins. Res.	.21
63-2143	R10	Volume Control & Switch	1.81
63-2424	R21	39 Ohm W.W. 1W 10% Ins. Res.	.30
		MISCELLANEOUS	
11-85		Line Cord & Plug (6 ft.)	.65
12-1070		Wavemagnet Mtg. Brkt.	.25
14-1272		Plastic Table Cabinet for H723UZ	5.50
		MISCELLANEOUS Cont'd.	
16-656		Packing Carton	- - -
19-175		Coil Mtg. Clip (Used on S-17340)	.60
24-535		Line Cord Plug Cover	.10
49-689	SP1	5-1/4" PM Speaker	6.00
		ZC5091 Cone & Voice Coil	1.73
54-129		Speed Nut (9 used to mt. Grille & Baffle)	.60C
54-271		6-32 X 1/4" Palnut Steel (1 used on ea. I.F.)	.01
57-1686		Emblem Plate	.35
57-1690		Emblem Mtg. Plate	.01
57-1717		Chassis Bottom Plate	.30
58-188		Two Prong Plug	.08
78-787		Two Contact Socket (Cabt. Back)	.10
78-806		Miniature Tube Socket	.15
78-869		Miniature Tube Socket	.20
78-870		Miniature Tube Socket (3 Used)	.15
78-871		Miniature Tube Socket	.15
78-903		Miniature Tube Socket	.30
83-1056		Wavemagnet Mtg. Strip	.03
83-1829		Insulator Strip	.07
85-501		Band Switch	1.40
97-293		Chassis Mtg. Stud (2 Used)	.18
110-152		Grill Cloth	.10
112-281		#10 X 3/4" Truss Hd. S.T. Stat. Br. Screw (2 Used Chassis Mtg.)	1.20C
114-297		#6 X 1/4" Hex Hd. S.T. (4 Used on S-17679 & 6 Used 57-1717)	.01
114-356		#6-32 X 1-1/4" Hex Hd. S.T. Screw (Used on 212-7)	.02
126-618		Tube Shield	.02
138-42		Cabinet Grill	1.60
139-91		Speaker Baffle	.15
149-89		Iron Core	.10
159-69		Plug Button	.01
196-153		Speaker Gasket	.40
202-697		F.M. Instruction Book	.10
202-860		Instruction Book	.10
212-7	SE1	Selenium Rectifier	1.80
S-17366		Cabt. Back Assem.	1.50
S-17679		Gang Cond. Shield & Terminal Strip Assem.	.30
S-17696	L19	Wavemagnet Assem.	1.25
S-17855	L21	Choke Coil Assem.	.25
S-17856	L20	Loop Loading Coil Assem.	.20

Prices shown are suggested list prices and are subject to change without notice.

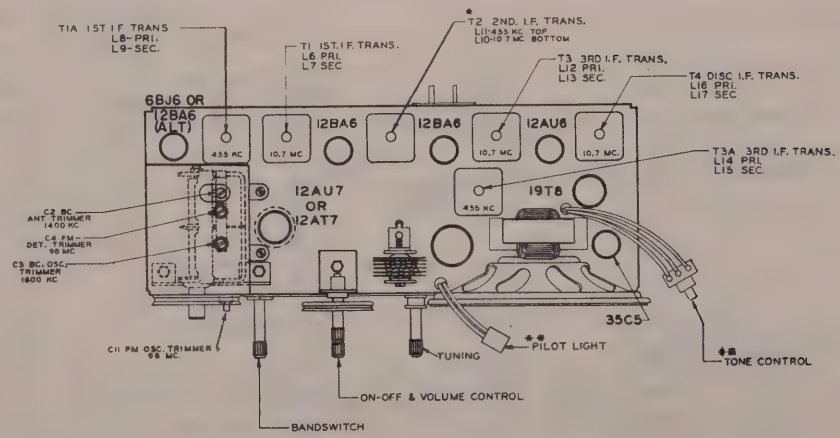
TUBE AND TRIMMER LOCATION



Detail of
IF Transformer



DIAL CORD DRIVE



NOTE:
I.F. TRANSFORMER CORE ADJUSTMENTS ARE ARRANGED AS FOLLOWS: ⊕ EXCEPT T2
PRIMARY ADJ. BOTTOM
SECONDARY ADJ. TOP

**NOTE:
ON MODEL 7H042 OMIT TONE CONTROL AND PILOT LIGHT.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2-12AT7 or 12AU7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 11, 14, 15	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and 13 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 or 12AU7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C11 Osc. Coil.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C4 Det. Coil.	Align det. stage to maximum reading.

TO THE SERVICE MAN:

The 7H02 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7H02 or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

The I.F. transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

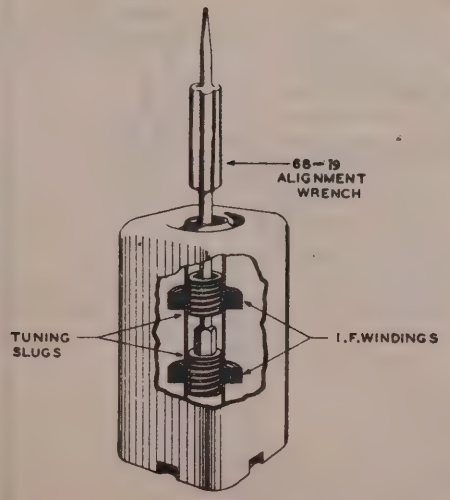
Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

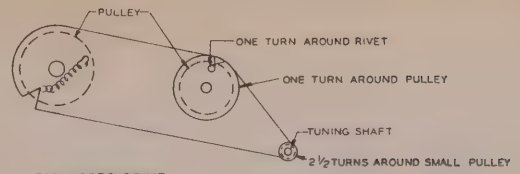
An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.

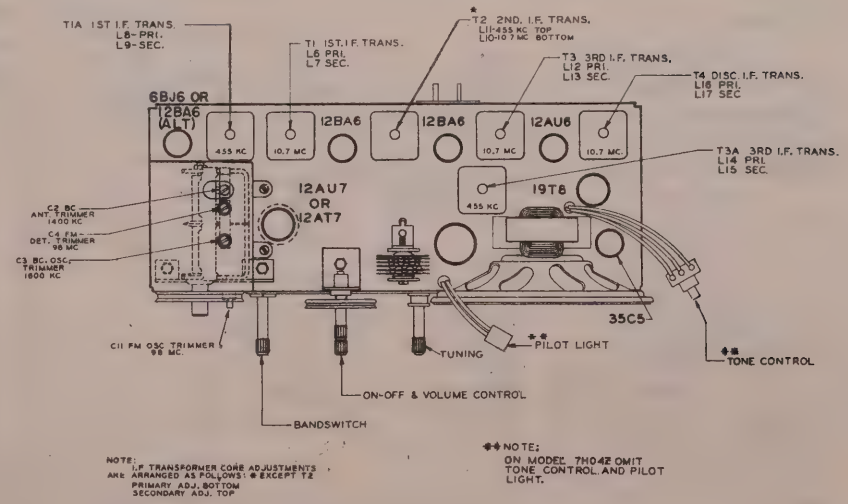
TUBE AND TRIMMER LOCATION



Detail of
IF Transformer



DIAL CORD DRIVE



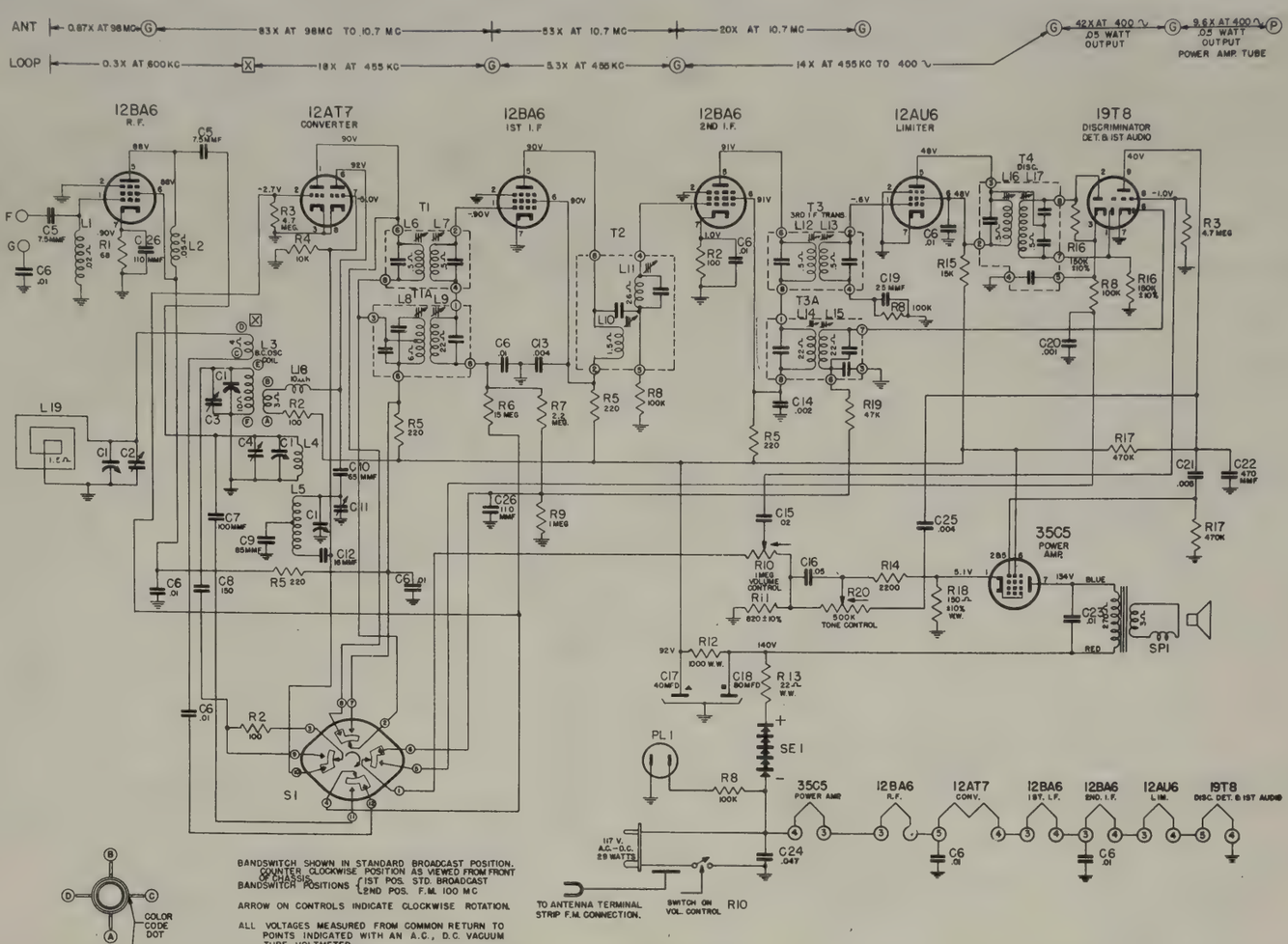
NOTE:
I.F. TRANSFORMER CORE ADJUSTMENTS ARE ARRANGED AS FOLLOWS: * EXCEPT T2
PRIMARY ADJ. BOTTOM
SECONDARY ADJ. TOP

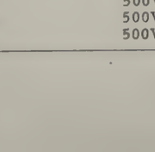
**NOTE:
ON MODEL 7H04Z OMIT
TONE CONTROL AND PILOT
LIGHT.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2-12AT7 or 12AU7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 11, 14, 15	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and 13 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 or 12AU7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C11 Osc. Coil.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C4 Det. Coil.	Align det. stage to maximum reading.

MODEL H724
CHASSIS 7H02





BANDSWITCH SHOWN IN STANDARD BROADCAST POSITION. COUNTER CLOCKWISE POSITION AS VIEWED FROM FRONT OF CHASSIS.

BANDSWITCH POSITIONS { 1ST POS. STD. BROADCAST; 2ND POS. F.M. 100 M.C.

ARROW ON CONTROLS INDICATE CLOCKWISE ROTATION.

ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. VAGUUM TUBE VOLTMETER.

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED

ALL RESISTORS ARE ±20% UNLESS OTHERWISE SPECIFIED.

⏚ DENOTES CHASSIS

AMP. MOD. I.F. FREQUENCY 455 K.C.

FREQ. MOD. I.F. FREQUENCY 10.7 M.C.

TUNING RANGES 540 — 1620 K.C. STANDARD BROADCAST. 88 — 108 M.C. FREQUENCY MOD.

PARTS LIST

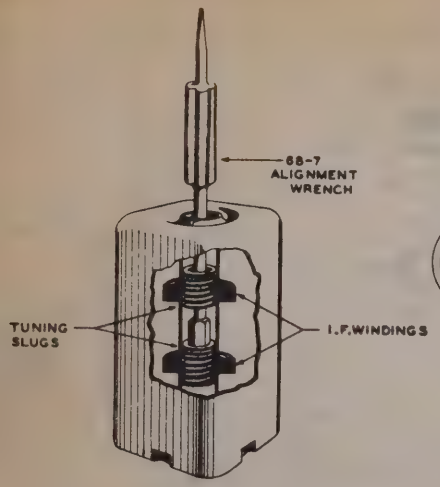
PART NO.		DESCRIPTION	PRICE
		DIAL ASSEMBLY	
26-451		Dial Scale	1.25
46-859		Band Switch Knob	.15
46-860		Tuning Control Knob	.15
46-900		Vol. Control Knob	.15
46-901		Tone Control Knob	.10
59-251		Dial Pointer	.70
78-904		Dial Light Socket Assem.	.25
80-69		Dial Cord Tension Spring	.05
100-105	PL1	Neon Indicator Bulb	.11
188-129		Retaining Ring (1 ea. used on S-17334 & S-17467)	.08
S-17334		Tuning Shaft & Pulley Assem.	.45
S-17336		Tuning Shaft Brkt. & Ins. Strip Assem.	.15
S-17350		Dial Cord & Eyelet Assem.	.07
S-17467		Pointer Shaft, Brkt. & Pulley Assem.	.60
		COILS & CHOKES	
20-329	L1	F. M. Antenna Coil	.15
20-330	L2	R. F. Plate Load Coil	.10
20-331	L4	F. M. Mixer Coil	
20-333	L18	R. F. Choke Coil	.25
95-1102	T3A	3rd. I. F. Trans. 455KC.	1.60
95-1150	T1-T3	1st. & 3rd. I. F. Trans. 10.7 MC (2 Used)	1.50
95-1153	T4	Discriminator Trans. 10.7 MC	1.50
95-1250	T1A	1st. I. F. Trans. 455KC.	1.60
95-1251	T2	2nd. I. F. Trans. 10.7 MC & 455KC	1.65
S-17340	L3	B.C. Osc. Coil Assem.	1.00
		CONDENSERS	
22-3	C6	.01 Mfd. Ceramic (9 Used	500V .26
22-4	C25	.004 Mfd. Ceramic	500V .26
22-5	C26	110 Mmfd. Ceramic (Disc) (or 22-1669) (2 Used)	500V .26
22-6	C22	470 Mmfd Ceramic	500V .26
22-229	C21	.005 Mfd.	500V .20
22-448	C13	.004 Mfd.	600V .20
22-830	C15	.02 Mfd.	600V .20
22-1126	C23	.01 Mfd.	400V .20
22-1158	C16	.05 Mfd.	200V .20
22-1220	C14	.002 Mfd.	600V .20
22-1507	C19	25 Mmfd. Ceramic	500V .33
22-1669	C7	100 Mmfd. Ceramic	500V .20
22-1675	C8	150 Mmfd. Ceramic	500V .25

PART NO.		DESCRIPTION		PRICE
		CONDENSERS (Cont'd.		
22-1676	C20	.001 Mfd. Ceramic	500V	.40
22-1757	C17,C18	Elect. 40 Mfd. 150V - 80 Mfd	150V	2.00
22-1775	C24	.047 Mfd.	400V	.26
22-1852	C5	7.5 Mmfd. Ceramic (2 Used)	500V	.35
22-2253	C11	Trimmer Cond. (Slug Tuned)		.60
22-2255	C1	Variable Gang (2 Section BC - 2 Section FM)		5.50
22-2256	C10	65 Mmfd. Ceramic	500V	.26
22-2257	C12	16 Mmfd. Ceramic	500V	.26
22-2258	C9	85 Mmfd. Ceramic	500V	.30
		RESISTORS		
63-686	R18	150 Ohm W.W. 1/2W 10% Ins. Res.		.21
63-1450	R13	22 Ohm W.W. 1W 20% Ins. Res.		.24
63-1527	R12	1000 Ohm W.W. 3W 20% Ins. Res.		.39
63-1737	R1	68 Ohm 1/2W 20% Ins. Res.		.21
63-1744	R2	100 Ohm 1/2W 20% Ins. Res. (3 Used)		.21
63-1758	R5	220 Ohm 1/2W 20% Ins. Res. (4 Used)		.21
63-1782	R11	820 Ohm 1/2W 10% Ins. Res.		.21
63-1800	R14	2200 Ohm 1/2W 20% Ins. Res.		.21
63-1828	R4	10K Ohm 1/2W 20% Ins. Res.		.21
63-1835	R15	15K Ohm 1/2W 20% Ins. Res.		.21
63-1856	R19	47K Ohm 1/2W 20% Ins. Res.		.21
63-1870	R8	100K Ohm 1/2W 20% Ins. Res. (4 Used)		.21
63-1876	R16	150K Ohm 1/2W 10% Ins. Res. (2 Used)		.21
63-1898	R17	470K Ohm 1/2W 20% Ins. Res. (2 Used)		.21
63-1912	R9	1 Megohm 1/2W 20% Ins. Res.		.21
63-1926	R7	2.2 Megohm 1/2W 20% Ins. Res.		.21
63-1940	R3	4.7 Megohm 1/2W 20% Ins. Res. (2 Used)		.21
63-1961	R6	15 Megohm 1/2W 20% Ins. Res.		.21
63-2143	R10	Volume Control & Switch		1.81
63-2144	R20	Tone Control		1.20
		MISCELLANEOUS		
11-85		Line Cord & Plug (6 ft. lg.)		.65
12-1070		Wavemagnet Mtg. Brkt.		.25
14-1273		Plastic Cabinet for H724 Table Model		5.50
16-657		Packing Carton		----
24-535		Line Cord Plug Cover		.10
43-165		Handle Housing		1.00
49-689	SP1	5 1/4" PM Speaker		6.00
		ZC5091 Cone & Voice Coil		1.73
54-129		Speed Nut (9 Used on Mtg. Grill & Baffle)		.60C

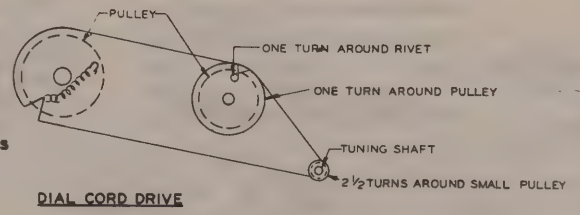
PART NO.		DESCRIPTION	PRICE
		MISCELLANEOUS Cont'd.	
54-271		6-32 X 1/4" Palnut Steel Cad. (1 used on ea. I.F.)	.01
54-305		3/8-32 X 9/16" Panut St. Br. (Chassis Mtg.)	.01
57-1686		Emblem Plate	.35
57-1690		Emblem Mtg. Plate	.01
58-188		Two Prong Plug (AC)	.08
78-787		Two Contact Socket (Cabt. Back)	.10
78-806		Miniature Tube Socket	.15
78-807		Miniature Tube Socket	.15
78-869		Miniature Tube Socket	.20
78-870		Miniature Tube Socket (2 Used)	.15
78-871		Miniature Tube Socket	.15
78-903		Miniature Tube Socket	.30
83-1056		Wavemagnet Mtg. Strip	.03
83-1393		Rubber Strip (Handle)	.30
83-1789		Rubber Strip (Rubber)	.07
83-1829		Insulator Strip	.07
85-493		Band Switch	1.15
93-487	S1	1/16 X .144 X 3/8" Steel Washer Cad. (2 Used on 43-165)	.01
97-293		Chassis Mtg. Stud (2 Used)	.18
110-152		Grill Cloth	.10
112-281		#10 X 3/4" Oval Binding Hd. S.T. St. Br. (2 Used Chassis Mtg.)	1.20C
114-78		#8 X 5/16 Hex Hd. S1. S.T. (Used on S-17364)	.01
114-261		#6 X 3/8 Hex Hd. S1. S.T. (2 Used on 43-165)	1.30C
114-356		#6-32 X 1-1/4" Hex Hd. S.T. (Used on 212-7)	.02
138-42		Cabinet Grille	1.60
139-91		Speaker Baffle	.15
149-89		Iron Core (Used on S-17340)	.10
159-69		Plug Button (4 Used to mt. Back)	.01
171-11		Pilot Light Jewel	.20
194-22		Insulator	.15
196-153		Speaker Gasket	.40
199-103		Flexible Handle Sleeve	.35
202-697		F.M. Inst. Book	.10
202-842		Instruction Book	.08
212-7	SE1	Selenium Rectifier	1.80
S-13210		Strap & Rivet Assem. (Handle)	.20
S-14527		Wavemagnet Lead & Stop Assem.	.20
S-17364	L19	Wavemagnet Assem.	1.00
S-17366		Cabinet Back Assem. (Complete)	1.50

Prices shown are suggested list prices and are subject to change without notice.

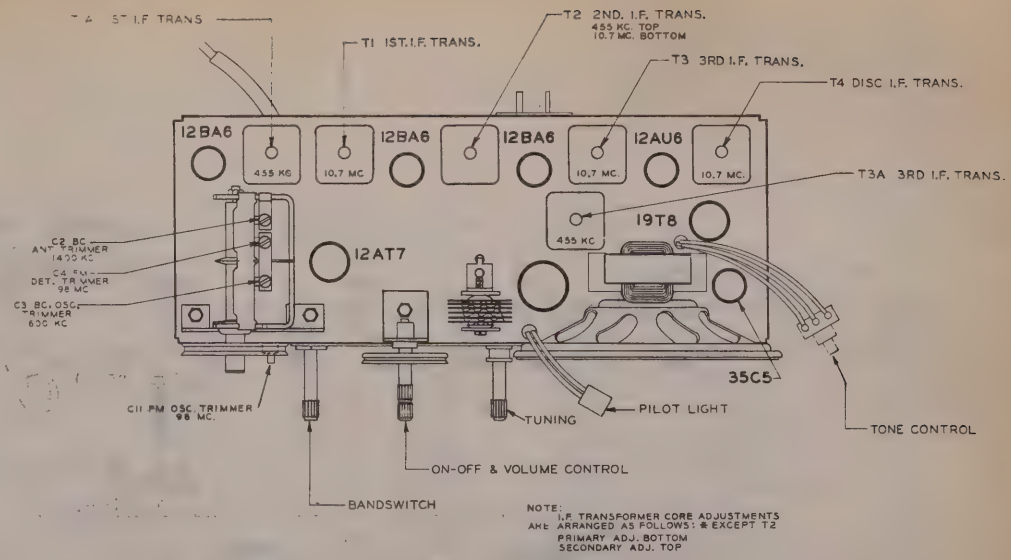
TUBE AND TRIMMER LOCATION



Detail of
IF Transformer



DIAL CORD DRIVE



ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 11, 14, 15	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and L13 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C11 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C4 Det. Coil Slug	Align det. stage to maximum reading.

TO THE SERVICE MAN.

The 7H02Z chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7H02Z or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

The I.F. transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not abbolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

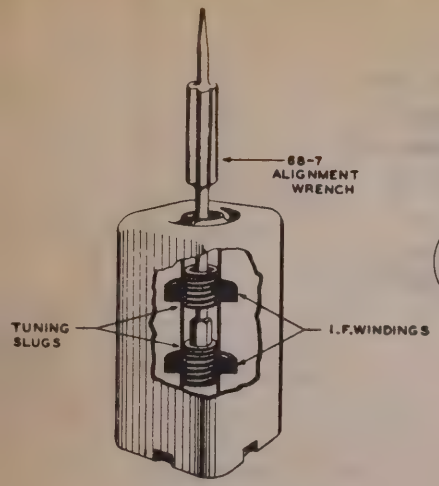
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

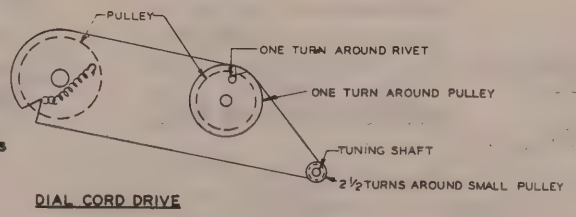
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

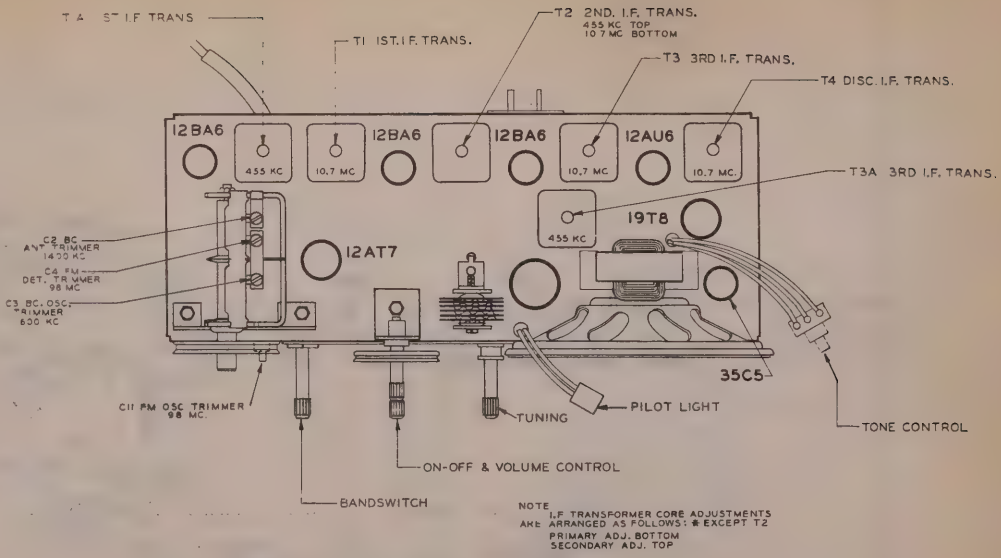
TUBE AND TRIMMER LOCATION



Detail of
IF Transformer



DIAL CORD DRIVE

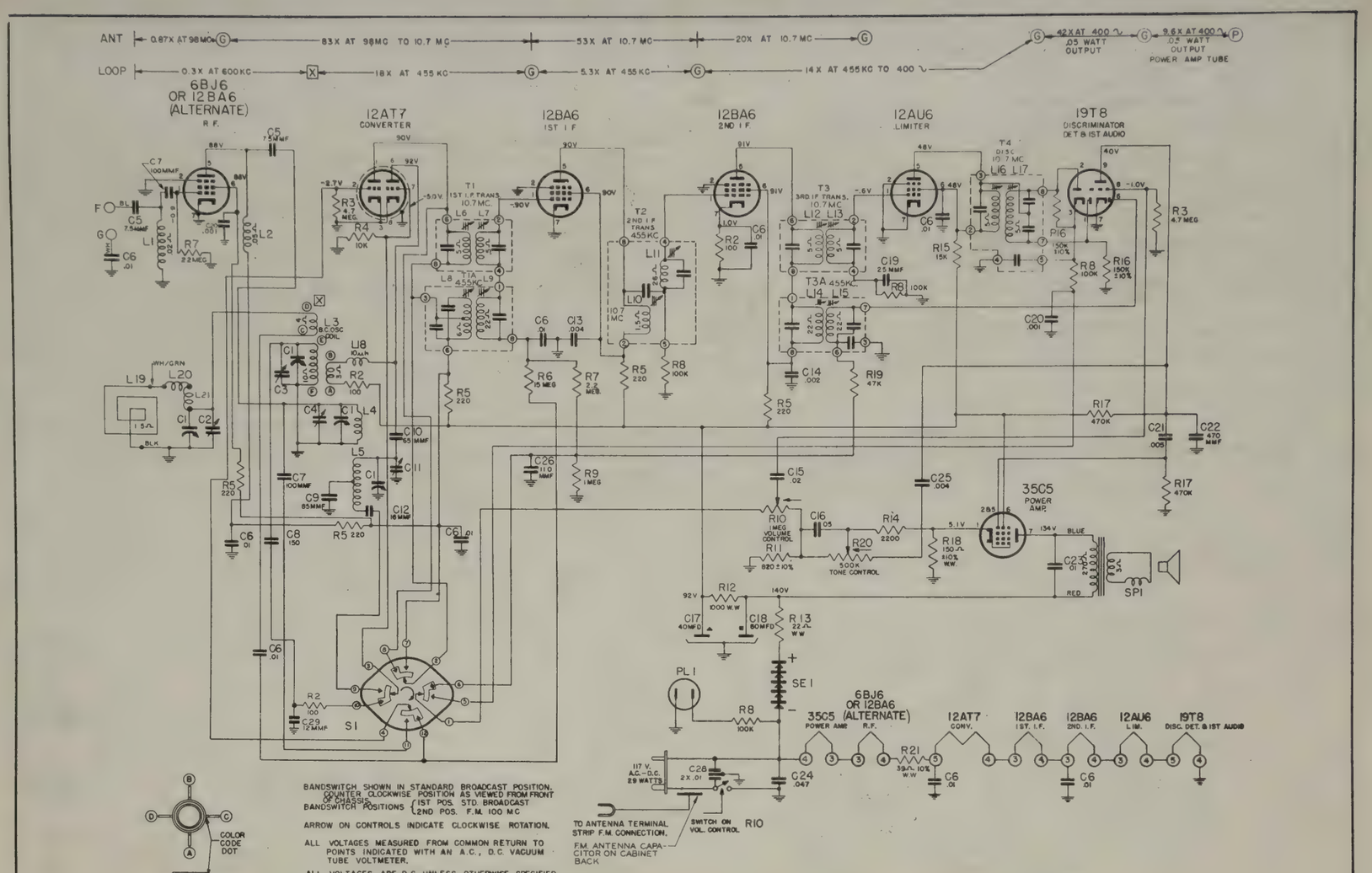


NOTE
I.F TRANSFORMER CORE ADJUSTMENTS ARE ARRANGED AS FOLLOWS: * EXCEPT T2
PRIMARY ADJ. BOTTOM
SECONDARY ADJ. TOP

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 11, 14, 15	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and L13 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C11 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C4 Det. Coil Slug	Align det. stage to maximum reading.

MODEL H724Z
CHASSIS 7H02Z


ANT
0.87X AT 98MC
83X AT 98MC TO 10.7 MC
53X AT 10.7 MC
20X AT 10.7 MC
LOOP
0.3X AT 600KC
18X AT 455 KC
5.3X AT 455KC
14X AT 455KC TO 400
42X AT 400 .05 WATT OUTPUT
9.6X AT 400 .05 WATT OUTPUT
POWER AMP TUBE
6BJ6 OR 12BA6 (ALTERNATE) R.F.
12AT7 CONVERTER
12BA6 1ST I.F.
12BA6 2ND I.F.
12AU6 LIMITER
19T8 DISCRIMINATOR DET. & 1ST AUDIO
T1 1ST I.F. TRANS. 10.7MC.
T2 2ND I.F. TRANS. 455KC
T3 3RD I.F. TRANS. 10.7MC
T3A 455KC
T4 DISC 10.7 MC
3505 POWER AMP.
SPI
SI
PL1
SE1
6BJ6 OR 12BA6 (ALTERNATE) 3505 POWER AMP R.F.
12AT7 CONV.
12BA6 1ST. I.F.
12BA6 2ND. I.F.
12AU6 LIM.
19T8 DISC. DET. & 1ST AUDIO
117 V. A.C.-D.C. 2.9 WATTS
TO ANTENNA TERMINAL STRIP F.M. CONNECTION.
F.M. ANTENNA CAPACITOR ON CABINET BACK
SWITCH ON VOL. CONTROL R10
COLOR CODE DOT
B.C. OSC. COIL L3
BANDSWITCH SHOWN IN STANDARD BROADCAST POSITION, COUNTER CLOCKWISE POSITION AS VIEWED FROM FRONT OF CHASSIS.
BANDSWITCH POSITIONS (1ST POS. STD. BROADCAST 2ND POS. F.M. 100 MC
ARROW ON CONTROLS INDICATE CLOCKWISE ROTATION.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED
ALL RESISTORS ARE ±20% UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7 M.C.
TUNING RANGES 540 – 1620 K.C. STANDARD BROADCAST. 88 – 108 M.C. FREQUENCY MOD.

PARTS LIST

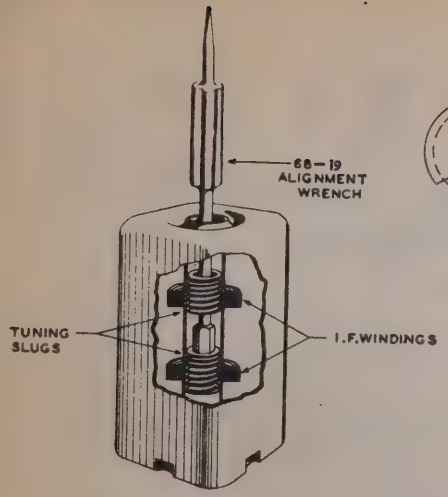
PART NO.	DIAG. NO.	DESCRIPTION		PRICE
		DIAL ASSEMBLY		
26-451		Dial Scale		1.25
46-859		Band Switch Knob		.15
46-860		Tuning Control Knob		.15
46-900		Vol. Control Knob		.15
46-901		Tone Control Knob		.10
59-251		Dial Pointer		.70
78-904		Dial Light Socket & Wire		.25
80-69		Dial Cord Tension Spring		.05
100-105	PL1	Neon Indicator Bulb		.11
188-129		Retaining Ring (Used on S-17334 & S-17467)		.08
S-17334		Tuning Shaft & Pulley Assem.		.45
S-17336		Tuning Shaft Brkt. & Ins. Strip Assem.		.15
S-17350		Dial Cord & Eyelet Assem.		.07
S-17467		Brkt. & Pulley Assem.		.60
		COILS & CHOKES		
20-328	L5	F.M. Osc. Coil Assem.		.10
20-331	L4	F.M. Mixer Coil		.05
20-333	L18	R.F. Choke Coil		.25
20-335	L2	R.F. Plate Load Coil		.20
20-336	L1	F.M. Ant. Coil		.15
95-1102	T3A	3rd. I.F. Trans. 455KC		1.60
95-1150	T3	1st. & 3rd. I.F. Trans. 10.7MC (2 Used)		1.50
95-1153	T4	Disc. Trans. 10.7MC		1.50
95-1250	T1A	1st. I.F. Trans. 455KC		1.60
95-1251	T2	2nd. I.F. Trans. 10.7MC & 455KC		1.65
S-17340	L3	B.C. Osc. Coil Assem.		1.00
		CONDENSERS		
22-4	C25	.004 Mfd. Ceramic	500V	.26
22-5	C26	110 Mmfd. Ceramic (Disc) (or 22-1669)	500V	.26
22-6	C22	470 Mmfd. Ceramic	500V	.26
22-229	C21	.005 Mfd.	500V	.20
22-448	C13	.004 Mfd.	600V	.20
22-830	C15	.02 Mfd.	600V	.20
22-1126	C23	.01 Mfd.	400V	.20
22-1158	C16	.05 Mfd.	200V	.20
22-1220	C14	.002 Mfd.	600V	.20
22-1507	C19	25 Mmfd. Ceramic	500V	.33
22-1669	C7	100 Mmfd. Ceramic (2 Used)	500V	.20
22-1675	C8	150 Mmfd. Ceramic	500V	.25
22-1676	C20	.001 Mfd. Ceramic (2 Used)	500V	.40

PART NO.	DIAG. NO.	DESCRIPTION		PRICE
		CONDENSERS Con't.		
22-1757	C17,C18	Elect. Cond. 40 Mfd. - 150V & 80 Mfd.	150V	2.00
22-1775	C-24	.047 Mfd.	400V	.26
22-1852	C5	7.5 Mmfd. Ceramic (2 Used)	500V	.35
22-2253	C11	Trimmer Cond. (Slug Tuned)		.60
22-2255	C1	Variable Gang Two Section B.C. & Two Section F.M.		5.50
22-2256	C10	65 Mmfd. Ceramic	500V	.26
22-2257	C12	16 Mmfd. Ceramic	500V	.26
22-2258	C9	85 Mmfd. Ceramic	500V	.30
22-2276	C28	Dual Ceramic .01 Mfd. - .01 Mfd.	500V	.50
22-2278	C29	12 Mmfd. Ceramic	500V	.30
		RESISTORS		
63-686	R18	150 Ohm W.W. 1/2W 10% Ins. Res.		.21
63-1450	R13	22 Ohm W.W. 1W 20% Ins. Res.		.24
63-1527	R12	1000 Ohm W.W. 3W 20% Ins. Res.		.39
63-1744	R2	100 Ohm 1/2W 20% Ins. Res. (3 Used)		.21
63-1758	R5	220 Ohm 1/2W 20% Ins. Res. (5 Used)		.21
63-1782	R11	820 Ohm 1/2W 10% Ins. Res.		.21
63-1800	R14	2200 Ohm 1/2W 20% Ins. Res.		.21
63-1828	R4	10K Ohm 1/2W 20% Ins. Res.		.21
63-1835	R15	15K Ohm 1/2W 20% Ins. Res.		.21
63-1856	R19	47K Ohm 1/2W 20% Ins. Res.		.21
63-1870	R8	100K Ohm 1/2W 20% Ins. Res. (4 Used)		.21
63-1876	R16	150K Ohm 1/2W 10% Ins. Res. (2 Used)		.21
63-1898	R17	470K Ohm 1/2W 20% Ins. Res. (2 Used)		.21
63-1912	R9	1 Megohm 1/2W 20% Ins. Res.		.21
63-1926	R7	2.2 Megohm 1/2W 20% Ins. Res. (2 Used)		.21
63-1940	R3	4.7 Megohm 1/2W 20% Ins. Res. (2 Used)		.21
63-1961	R6	15 Megohm 1/2W 20% Ins. Res.		.21
63-2143	R10	Vol. Control & Switch		1.81
63-2144	R20	Tone Control		1.20
63-2424	R21	39 Ohm W.W. 1W 10% Ins. Res.		.30
		MISCELLANEOUS		
11-85		Line Cord & Plug (6 ft.)		.65
12-1070		Wavemagnet Mtg. Brkt.		.25
14-1273		Plastic Cabinet for H724UZ		5.50
16-657		Packing Carton		
19-175		Coil Mtg. Clip		.06
24-535		Line Cord Plug Cover		.10
43-165		Handle Housing		1.00

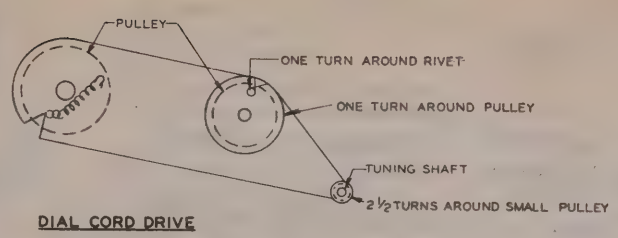
PART NO.	DIAG. NO.	DESCRIPTION	PRICE
		MISCELLANEOUS Con't.	
49-689	SP1	5-1/4" PM Speaker	6.00
		ZC5091 Cone & Voice Coil	1.73
54-129		Speed Nut (9 used to mt. Grill & Baffle)	.60C
54-271		6-32 X 1/4" Palnut (1 used on ea. I.F.)	.01
54-305		Palnut Steel Stat. Br. (Used on Chassis Mtg.)	.01
57-1686		Emblem Plate	.35
57-1690		Emblem Mtg. Plate	.01
57-1717		Chassis Bottom Plate	.30
58-188		Two Prong Plug (AC)	.08
78-787		Two Contact Socket (Cabt. Back)	.10
78-806		Miniature Tube Socket	.15
78-869		Miniature Tube Socket	.20
78-870		Miniature Tube Socket (3 Used)	.15
78-871		Miniature Tube Socket	.15
78-903		Miniature Tube Socket	.30
83-1056		Wavemagnet Mtg. Strip	.03
83-1789		Handle Strip (Rubber)	.07
83-1829		Insulator Strip	.07
85-501	S1	Band Switch	1.40
93-487		1/16 X .144 X 3/8 Washer Steel (2 Used on 43-165)	.01
97-293		Chassis Mtg. Stud (2 Used)	.18
110-152		Grill Cloth	.10
112-281		#10 X 3/4" Truss Hd. S.T. Screw St. Br. (2 Used Chassis Mtg.)	1.20C
114-356		#6-32 X 1-1/4" Hex Hd. S.T. Screw (Used on 212-7)	.02
114-366		#6 X 3/8 Hex Hd. S.T. Screw (2 Used on 43-165)	.02
126-618		Tube Shield	.02
138-42		Cabinet Grille	1.60
139-91		Speaker Baffle	.15
149-89		Iron Core (Used on S-17340)	.10
159-69		Plug Button (4 Used on S-17841)	.01
171-11		Pilot Light Jewel	.20
196-153		Speaker Gasket	.40
199-103		Flexible Handle Sleeve	.35
202-697		F.M. Inst. Book	.10
202-859		Inst. Book	.10
212-7		Selenium Rectifier	1.80
S-13210		Strap & Rivet Assem.	.20
S-17679		Gang Cond. Shield & Terminal Assem.	.30
S-17696	L19	Wavemagnet Assem.	1.25
S-17841		Cabt. Back Assem. (Comp.)	1.75
S-17855	L21	Choke Coil Assem.	.25
S-17856	L20	Loop Loading Coil Assem.	.20

Prices shown are suggested list prices and are subject to change without notice.

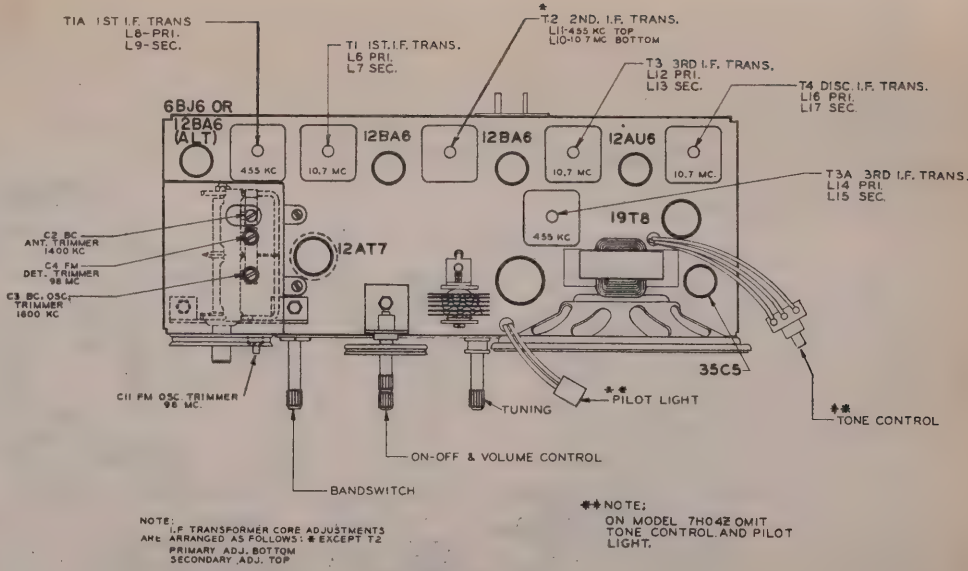
TUBE AND TRIMMER LOCATION



Detail of
IF Transformer



DIAL CORD DRIVE



NOTE:
I.F TRANSFORMER CORE ADJUSTMENTS ARE ARRANGED AS FOLLOWS: * EXCEPT T2
PRIMARY ADJ. BOTTOM
SECONDARY ADJ. TOP

**NOTE:
ON MODEL 7H04Z OMIT
TONE CONTROL AND PILOT
LIGHT.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 11, 14, 15	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and L13 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line cnt.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C11 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C4 Det. Coil Slug	Align det. stage to maximum reading.

TO THE SERVICE MAN:

The 7G01Z chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

When adjustments are made on the 7G01Z or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

428A

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustments will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

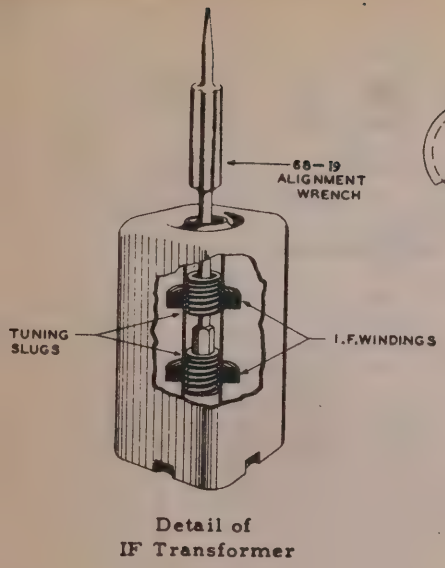
A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

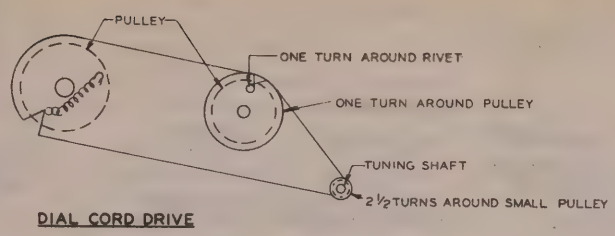
The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.

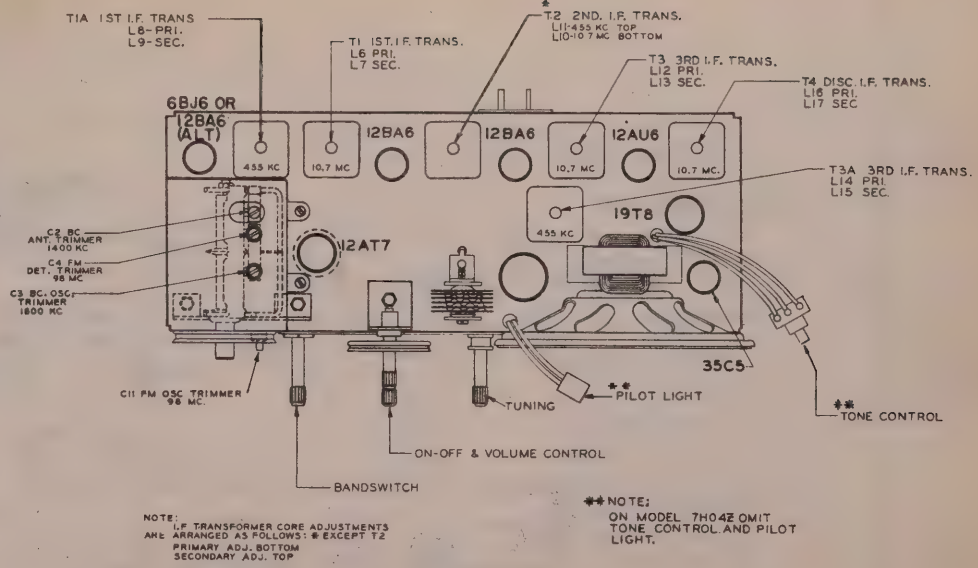
TUBE AND TRIMMER LOCATION



Detail of
IF Transformer



DIAL CORD DRIVE



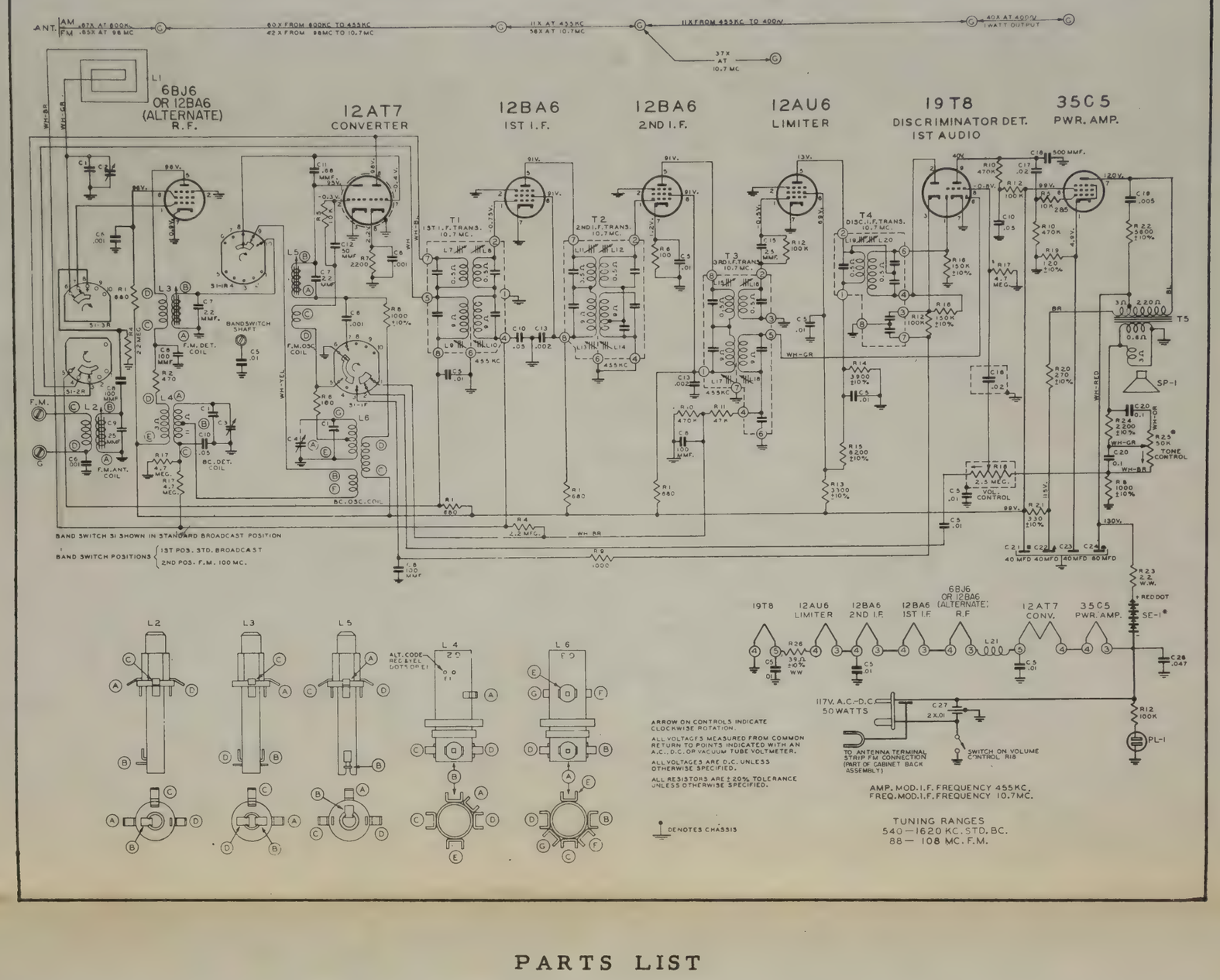
NOTE:
I.F. TRANSFORMER CORE ADJUSTMENTS ARE ARRANGED AS FOLLOWS: * EXCEPT T2
PRIMARY ADJ. BOTTOM
SECONDARY ADJ. TOP

**NOTE:
ON MODEL 7H04Z OMIT TONE CONTROL AND PILOT LIGHT.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9,11,14,15	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C 3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C 2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and L13 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C11 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C4 Det. Coil Slug	Align det. stage to maximum reading.

MODEL H725
CHASSIS 7G01Z

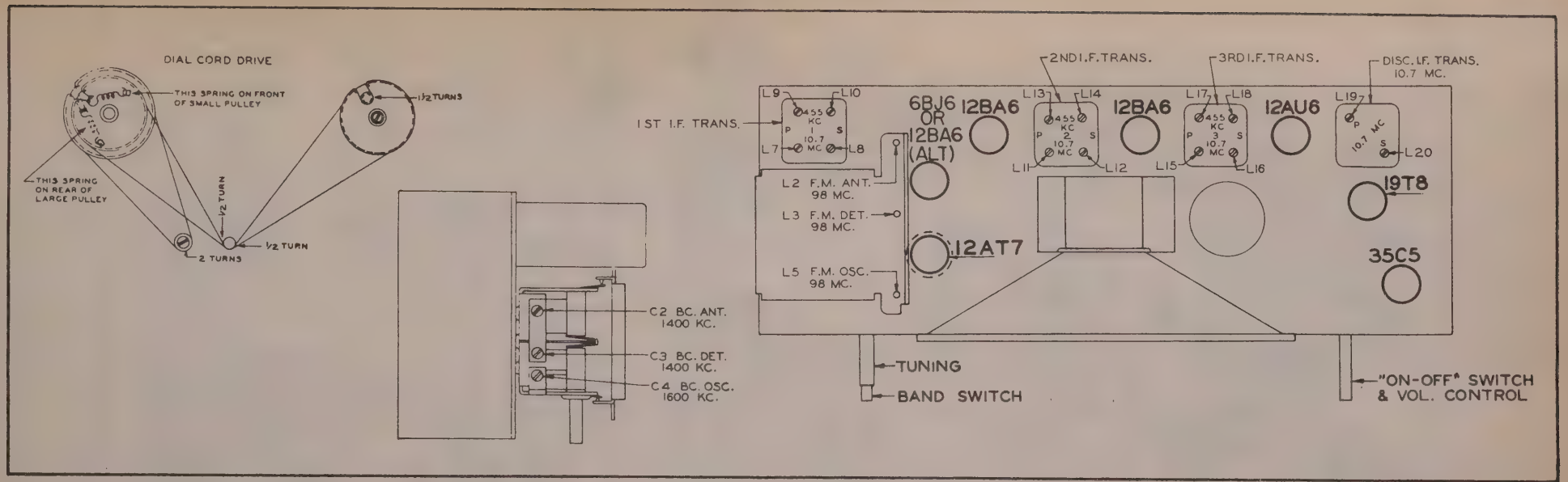

ANT.
AM .07X AT 600KC
FM .65X AT 98 MC
80 X FROM 600KC TO 433KC
42 X FROM 98MC TO 10.7MC
11X AT 433KC
58X AT 10.7MC
11X FROM 433KC TO 400KC
40X AT 400V
1 WATT OUTPUT
37X AT 10.7 MC
6BJ6 OR 12BA6 (ALTERNATE) R.F.
12AT7 CONVERTER
12BA6 1ST I.F.
12BA6 2ND I.F.
12AU6 LIMITER
19T8 DISCRIMINATOR DET. 1ST AUDIO
35C5 PWR. AMP.
T1 1ST I.F. TRANS. 10.7 MC.
T2 2ND I.F. TRANS. 10.7 MC.
T3 3RD I.F. TRANS. 10.7 MC.
T4 DISC. I.F. TRANS. 10.7 MC.
T5
SP-1
TONE CONTROL
VOLUME CONTROL
F.M. DET. COIL
BC. DET. COIL
F.M. ANT. COIL
BC. OSC. COIL
F.M. OSC. COIL
BANDSWITCH SHAFT
BAND SWITCH SHOWN IN STANDARD BROADCAST POSITION
BAND SWITCH POSITIONS
1ST POS. STD. BROADCAST
2ND POS. F.M. 100 MC.
455 KC
40 MFD 40MFD 40 MFD 80 MFD
117V. A.C.-D.C. 50 WATTS
TO ANTENNA TERMINAL STRIP FM CONNECTION (PART OF CABINET BACK ASSEMBLY)
SWITCH ON VOLUME CONTROL R18
PL-1
SE-1
L2
L3
L5
L4
L6
ALT. CODE-RED & YEL DOTS OR E1
ARROW ON CONTROLS INDICATE CLOCKWISE ROTATION.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
AMP. MOD. I.F. FREQUENCY 455KC.
FREQ. MOD. I.F. FREQUENCY 10.7MC.
TUNING RANGES
540—1620 KC. STD. BC.
88— 108 MC. F.M.

PARTS LIST

PART NO.	DIAG. NO.	DESCRIPTION	PRICE
		DIAL ASSEMBLY	
12-1768		Dial Light Socket Mtg. Brkt.	
26-445		Dial Scale	3.90
46-538		Tuning Control Knob	.10
46-718		Band Switch Knob	.15
46-855		Tone Control Knob	.10
57-1613		Cabinet Emblem Plate	.20
57-1615		Dial Scale Clamping Plate	.01
57-1641		Name Plate	.35
59-245		Dial Pointer	.70
78-894		Dial Light Socket	
80-69		Dial Cord Spring	.05
80-209		Dial Cord Spring	.03
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-817		Tuner Spring	.06
80-818		Tuner Arm Pressure Spring	.12
80-865		Ground Spring (2 Used)	.05
93-475		Felt Washer (used on S-14129)	1.81C
93-1043		Spring Washer (used on S-16735)	
100-105	PL1	Neon Bulb	.11
114-26		8-18x1/4" lg. x 1/4" Hex Hd. S.T. (2 used on 12-1768)	.55C
171-11		Pilot Light Jewel	.20
188-102		Clamping Ring (used on 46-538)	.02
S-13945		Cam, Pulley & Pushing Assembly	.55
S-13983		Dial Cord & Eyelet Assembly	.06
S-14129		Volume Control Knob Assembly	.30
S-14429		Tuner Arm Assembly	.80
S-16735		Pulley & Bushing Assembly	.25
S-16884		Tuning Shaft & Pulley Assembly	.25
S-16887		Dial Cord & Eyelet Assembly	.05
		COILS & CHOKES	
S-13971	T2	2nd I.F. Transformer Assembly	2.75
S-13972	T3	3rd I.F. Transformer Assembly	3.00
S-13973	T4	Discriminator Transformer Assembly	2.00
S-13997	L21	Filament Choke Coil Assembly	.40
S-14192	L2	F.M. Antenna Coil Assembly	.70
S-15733	L5	F.M. Oscillator Assembly	.55
S-15743	L3	F.M. Detector Coil Assembly	.65
S-15981	T1	1st I.F. Transformer Assembly	2.50
S-16344	L4	Broadcast Detector Coil Assembly	.60
S-16345	L6	Broadcast Oscillator Coil Assembly	.60
		CONDENSERS	
22-3	C5	.01 Mfd. Ceramic (Disc) (11 used) 500V	.26
22-5	C8	110 Mmfd. Ceramic (Disc) (4 used) (or 22-1669) 500V	.26
22-829	C10	.05 Mfd. (3 used) 200V	.20
22-830	C17	.02 Mfd. 600V	.20
22-854	C18	.0005 Mfd. 600V	.20
22-1220	C13	.002 Mfd. (2 used) 600V	.20
22-1367	C12	50 Mmfd. Ceramic 500V	.33
22-1506	C7	22 Mmfd. Ceramic (2 used) 500V	.33
22-1507	C15	25 Mmfd. Ceramic 500V	.33
22-1661	C21,22 C23,24	Elect. 80-40-40 Mfd. - 150V x 40 Mfd. 25V	3.00
22-1676	C6	.001 Mfd. Ceramic (4 used) 500V	.40
22-1677	C1	Three Gang Variable	4.35
22-1683	C16	.02 Mfd. 400V	.40
22-1702	C19	.005 Mfd. 400V	.20
22-1766	C11	.68 Mmfd. (Molded) 500V	.20
22-1775	C26	.047 Mfd. 400V	.26
22-2060	C9	25 Mmfd. Ceramic 500V	.30
22-2084	C20	.1 Mfd. (2 used) 200V	.26
22-2276	C27	Dual Ceramic - .01 Mfd. - .01 Mfd. 500V	.50
		RESISTORS	
63-1202	R21	330 Ohm W.W. 2W 10% Ins. Res.	.36
63-1450	R23	22 Ohm W.W. 1W 20% Ins. Res.	.24
63-1452	R20	270 Ohm W.W. 2W 10% Ins. Res.	.33
63-1584	R18	Volume Control & Switch	1.84
63-1744	R6	100 Ohm 1/2W 20% Ins. Res. (2 used)	.21
63-1747	R19	120 Ohm 1/2W 10% Ins. Res.	.21
63-1772	R2	470 Ohm 1/2W 20% Ins. Res.	.21
63-1779	R1	680 Ohm 1/2W 20% Ins. Res. (4 used)	.21
63-1785	R8	1000 Ohm 1/2W 10% Ins. Res. (2 used)	.21
63-1786	R9	1000 Ohm 1/2W 20% Ins. Res.	.21
63-1799	R24	2200 Ohm 1/2W 10% Ins. Res.	.21
63-1800	R7	2200 Ohm 1/2W 20% Ins. Res.	.21
63-1806	R13	3300 Ohm 1/2W 10% Ins. Res.	.21
63-1810	R14	3900 Ohm 1/2W 10% Ins. Res.	.21
63-1817	R22	5600 Ohm 1/2W 10% Ins. Res.	.21
63-1824	R15	8200 Ohm 1/2W 10% Ins. Res.	.21
63-1828	R5	10K Ohm 1/2W 20% Ins. Res. (2 used)	.21
63-1856	R11	47K Ohm 1/2W 20% Ins. Res.	.21
63-1870	R12	100K Ohm 1/2W 20% Ins. Res. (4 used)	.21
63-1876	R16	150K Ohm 1/2W 10% Ins. Res. (2 used)	.21
63-1898	R10	470K Ohm 1/2W 20% Ins. Res. (3 used)	.21
63-1926	R4	2.2 Megohm 1/2W 20% Ins. Res. (2 used)	.21
63-1940	R17	4.7 Megohm 1/2W 20% Ins. Res. (3 used)	.21
63-2108	R25	Tone Control	1.20
63-2424	R26	39 Ohm W.W. 1W 10% Ins. Res.	.30
		MISCELLANEOUS	
11-85		A.C. Line Cord & Plug	.65
12-1070		Wavemagnet Mtg. Brkt. (2 used)	.25
14-1250		Plastic Cabinet for H725	7.25
16-606		Packing Carton	
19-139		Cabinet Back Ret. Clip (4 used)	.03
43-165		Handle Housing	1.00
49-608	SP1	7-1/2" P.M. Speaker ZC7121 Cone & Voice Coil	
54-139		3/8-32x9/16" Palnut (used to mt. 63-1584)	.01
54-140		3/8-32x9/16x3/32 Thk. Hex Hd. (used to mt. 63-2108)	.03
54-226		Speed Nut (1 ea. used on S-15743 - S-14192 & S-15733)	.01
54-269		8-32x11/32" Palnut (1 ea. used on S-13971 - S-13972 - S-13973 - S-15981)	.01
57-1269		I.F. Trans. Terminal Plate (8 used)	.06
58-128		Two Prong Plug	.15
78-787		Two Contact Socket	.10
78-788		Miniature Tube Socket (9 contact)	.35
78-794		Miniature Tube Socket (3 used)	.20
78-795		Miniature Tube Socket (7 contact)	.20
78-870		Miniature Tube Socket (7 contact)	.15
78-903		Miniature Tube Socket (9 contact)	.30
83-1056		Wavemagnet Mtg. Strip (2 used)	.03
83-1520		Rectifier Insulating Strip	.03
83-1782		Tone Control Ins. Strip	
83-1789		Handle Strip-Rubber	.07
83-1898		Asbestos Strip	
85-504	S1	Band Switch	
93-415		#6 Ext. Shakeproof Lockwasher (used on 212-7)	.25C
93-487		1/16x.144x3/8 Steel Washer (2 used on 43-165)	.01
94-334		Speaker Mtg. Bushing (4 used)	.67C
94-485		Fibre Bushing (1 ea. used on 63-1584 & 63-2108)	.03
95-1035	T5	Output Transformer	2.65
97-293		Insulating Stud (4 used on chassis)	.18
112-281		Chassis Mtg. Screw (4 used)	1.20C
112-697		6-20x7/16" S.T. Pan Hd. S.T. (4 used on S-17787)	.02
114-26		8-18x1/4" lg. x 1/4" A.F. Hex Hd. S.T. (2 used on S-13977)	.55C
114-78		8-18x1/4" lg. x 1/4" A.F. Hex Hd. S.T. (2 used on S-13977)	1.40C
114-356		6-32x1-1/4" lg. x 1/4" Hex Hd. S.T. (used on 212-7)	.02
114-366		6-32x3/8" lg. x 1/4" A.F. Hex Hd. S.T. (2 used on 43-166)	.02
126-618		Tube Shield	.02
138-46		Speaker Grille	
139-69		Speaker Baffle	.45
139-88		Baffle Board	.15
149-64		Tuning Core (3 used)	.40
188-30		Retaining Ring (used on S-16884)	1.20C
188-34		Retaining Ring (used on 63-2108)	1.20C
188-136		Trim Ring (2 used)	.20
199-103		Flexible Handle Sleeve	.35
202-697		F.M. Instruction Book	.10
202-871		Instruction Book	
212-7	SE1	Selenium Rectifier	1.80
S-13210		Strap & Rivet Assembly (handle)	.20
S-13977	L1	Wavemagnet Assembly	1.25
S-14358		Wavemagnet Cable Assembly	.20
S-17787		Cabinet Back Assembly (Complete)	

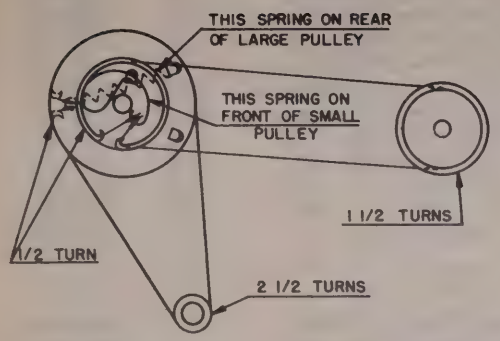
All prices are suggested list prices and are subject to change without notice.

TUNE THE TRIMMER LOCATION

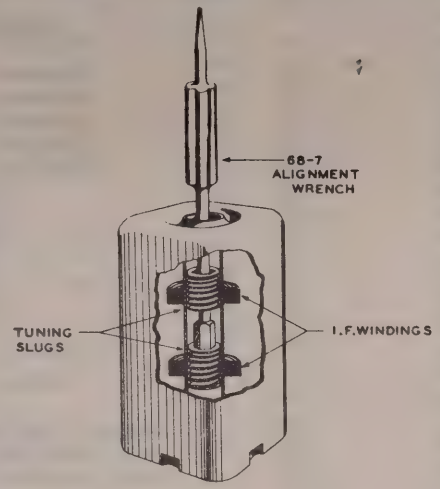


ALIGNMENT PROCEDURE

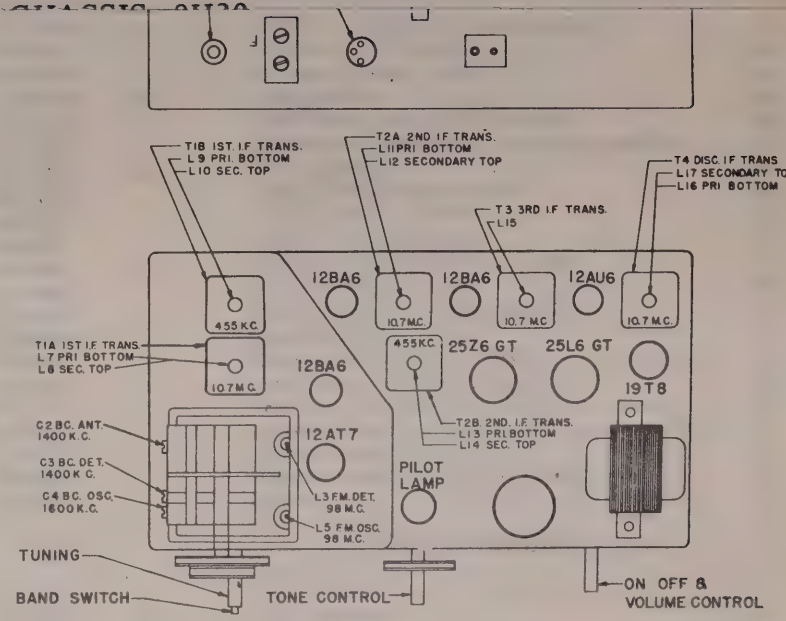
Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12AT7 Converter	.05 Mfd.	455 KC Modulated	BC	600 Kc	L-9, 10, 13, 14, 17 and 18	Align I.F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc Modulated	BC	1600 Kc	C4	Set oscillator to dial scale
3	2 turns loosely cpld. to wavemagnet		1400 Kc Modulated	BC	1400 Kc	C3 and C2	Align det. and ant. stages
4 (a)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L19 coil slug Primary discr.	Align primary of discriminator for maximum reading
5 (b)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L20 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 and L16 Prim. and Sec. of 3rd IF transformer	Align 3rd, IF transformer for maximum reading
7 (c)	Pin 1 (grid) on 12BA6 1st, IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer	Align 2nd. IF transformer for maximum reading
8 (c)	Pin 7 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st IF transformer	Align 1st. IF Transformer for maximum reading
9 (c)(d)	Antenna Post F (Remove line ant.)	270 ohms	98 Mc Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug	Set Oscillator to dial scale
10 (c)(d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 and L2 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading



DIAL CORD DRIVE



Detail of IF Transformer



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 8H20 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all Bands.

When adjustments are made on the 8H20 chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I F transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I F transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

TO THE SERVICE MAN:

The 7G01Z chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

When adjustments are made on the 7G01Z or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

428A

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustments will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

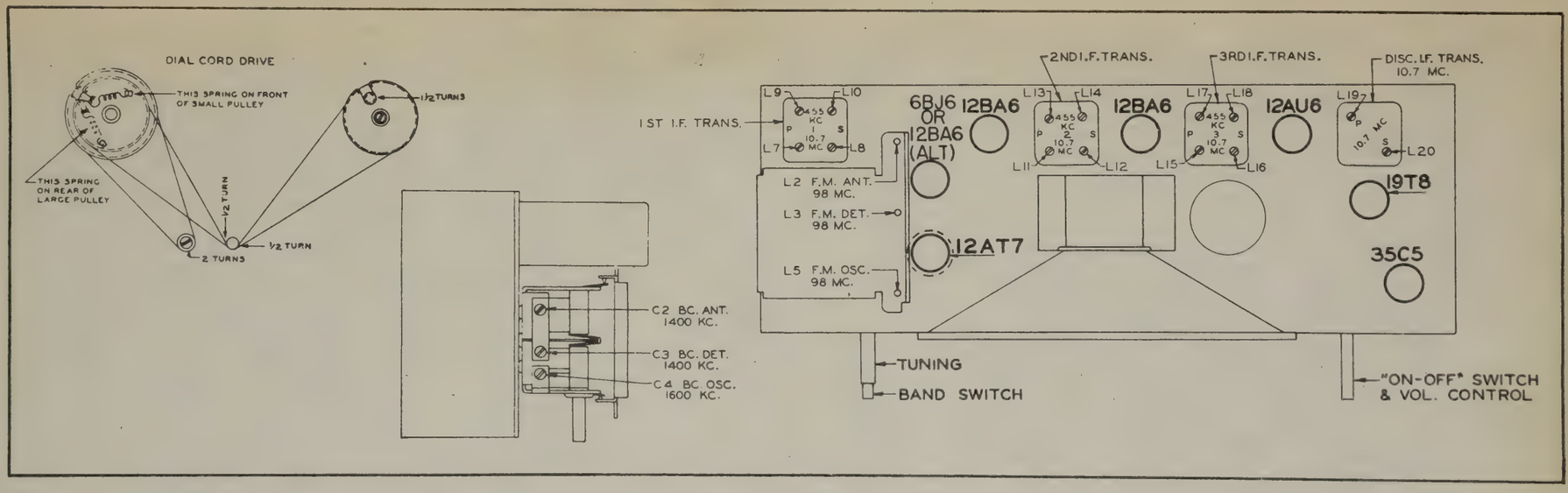
A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

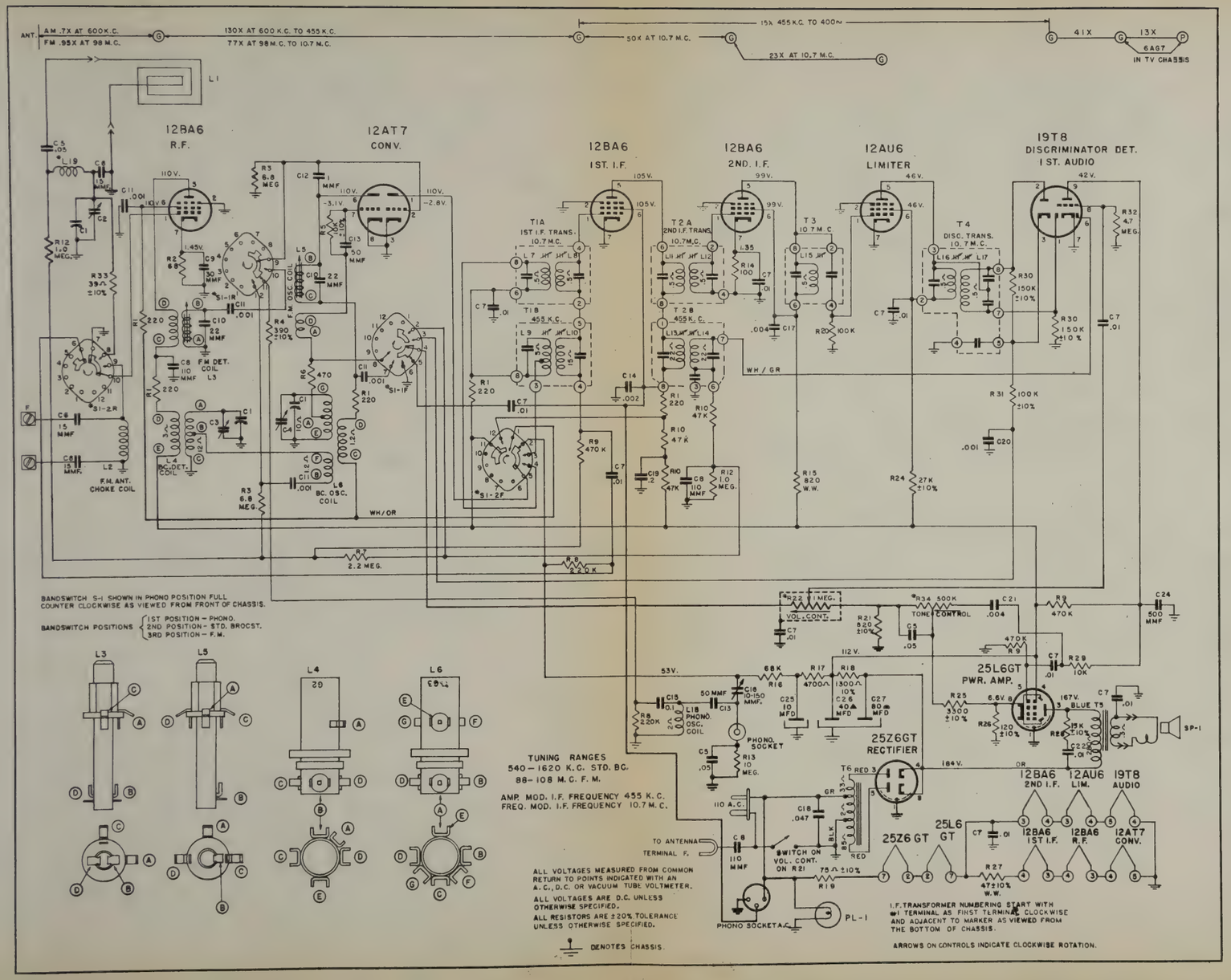
(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.

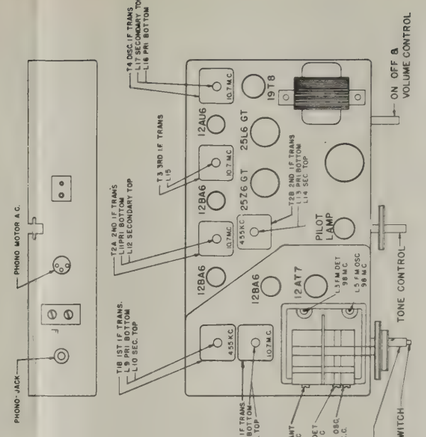
TUBE AND TRIMMER LOCATION

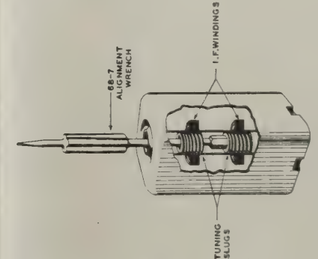


ALIGNMENT PROCEDURE

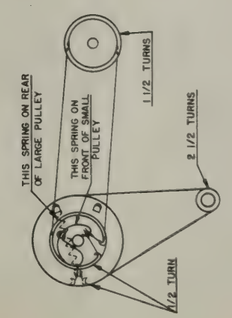
Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12AT7 Converter	.05 Mfd.	455 KC Modulated	BC	600 Kc	L-9, 10, 13, 14, 17 and 18	Align I.F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc Modulated	BC	1600 Kc	C4	Set oscillator to dial scale
3	2 turns loosely cpld. to wavemagnet		1400 Kc Modulated	BC	1400 Kc	C3 and C2	Align det. and ant. stages
4 (a)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L19 coil slug Primary discr.	Align primary of discriminator for maximum reading
5 (b)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L20 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading
6 (c)	Pin 1 (grid) on 12BA6 2nd. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 and L16 Prim. and Sec. of 3rd IF transformer	Align 3rd, IF transformer for maximum reading
7 (c)	Pin 1 (grid) on 12BA6 1st, IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer	Align 2nd. IF transformer for maximum reading
8 (c)	Pin 7 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st IF transformer	Align 1st. IF Transformer for maximum reading
9 (c)(d)	Antenna Post F (Remove line ant.)	270 ohms	98 Mc Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug	Set Oscillator to dial scale
10 (c)(d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 and L2 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading







Detail of IF Transformer



DIAL CORD DRIVE

TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 8H20 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all Bands.

When adjustments are made on the 8H20 chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I F transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I F transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 13, 14	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 Prim. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

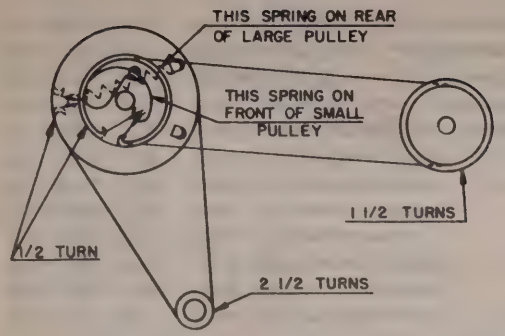
The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

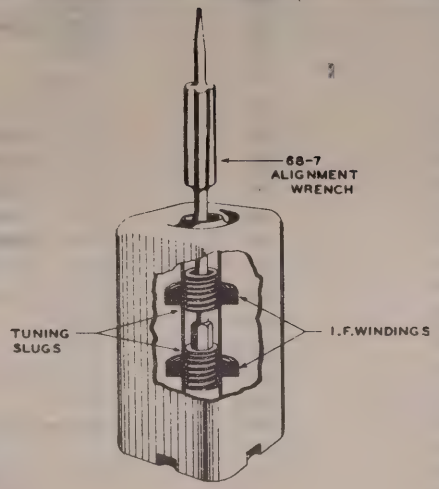
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

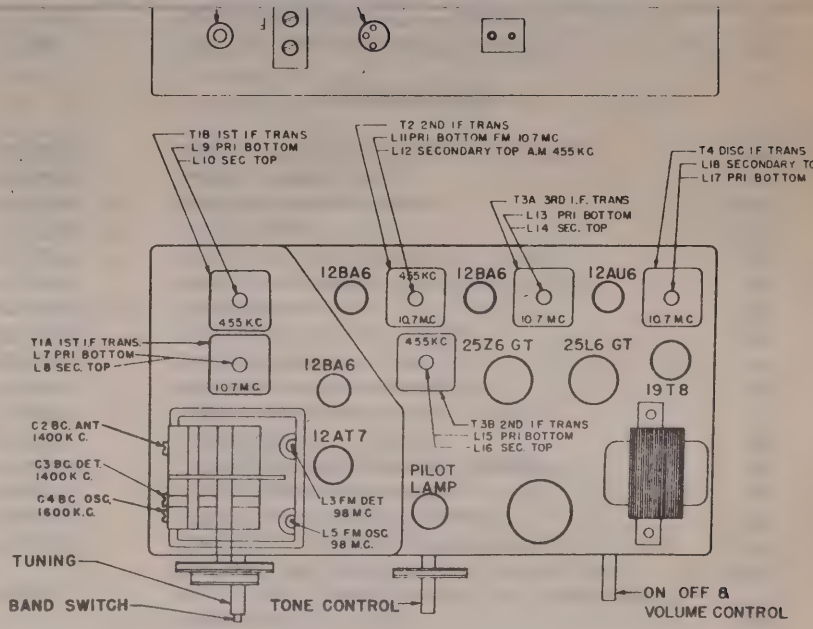
(d) Loosen Slugs by applying a hot iron to the cement.



DIAL CORD DRIVE



Detail of IF Transformer


T1B 1ST I.F. TRANS L9 PRI BOTTOM L10 SEC. TOP
T2 2ND I.F. TRANS L11 PRI BOTTOM FM 10.7 MC L12 SECONDARY TOP A.M. 455 KC
T4 DISC I.F. TRANS L18 SECONDARY TOP L17 PRI BOTTOM
T3A 3RD I.F. TRANS L13 PRI BOTTOM L14 SEC. TOP
12BA6
12BA6
12AU6
455 KC
10.7 MC
T1A 1ST I.F. TRANS L7 PRI BOTTOM L8 SEC. TOP
12BA6
25Z6 GT
25L6 GT
19T8
C2 BC. ANT 1400 K.C.
C3 BC. DET. 1400 K.C.
C4 BC. OSC. 1600 K.C.
12AT7
T3B 2ND I.F. TRANS L15 PRI BOTTOM L16 SEC. TOP
PILOT LAMP
L3 FM DET 98 MC
L5 FM OSC 98 MC.
TUNING
BAND SWITCH
TONE CONTROL
ON OFF & VOLUME CONTROL

TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 8H20 revised chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all Bands.

When adjustments are made on the 8H20 revised chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I F transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I F transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

PARTS LIST

DIAL ASSEMBLY

54-292		Speed Nut (used on S-17165)	.01
78-895		Dial Light Socket & Wire	.45
80-69		Dial Cord Spring	.05
80-746		Pulley Retaining Spring	.02
80-747		Dial Cord Spring	.10
80-781		Tuner Arm Tension Spring	.06
94-732		Pointer Pulley Bushing (Part of S-17165)	.30
100-97	PL-1	Pilot Light Bulb	.25
114-262		#8 x 7/16" Hex. Hd. Sl. S.T. (2 used to Mount S-17149)	.02
114-297		#6 x 1/4" Hex. Hd. Sl. S.T. (2 used to Mount S-17165)	.01
148-122		Tuner Arm	.20
188-30		Retaining Ring (used on S-17155)	.02
S-17149		Dial Scale & Bracket Assembly (26-449 & 26-450)	1.50
S-17155		Tuning Shaft & Pulley Assembly	.35
S-17157		Pointer & Pulley Assembly	.55
S-17158		Dial Cord & Eyelet Assembly (Long)	.07
S-17159		Dial Cord & Eyelet Assembly (Short)	.06
S-17165		Bracket & Pulley Bushing Assembly	.35

COILS & CHOKES

95-1102	T2B	2nd. I. F. Transformer	1.60
95-1150	T2A	2nd. I. F. Transformer	1.50
95-1152	T3	3rd. I. F. Transformer	1.40
95-1153	T4	Disc. Transformer	1.50
95-1200	T1B	1st. I. F. Transformer	1.60
95-1201	T1A	1st. I. F. Transformer	1.50
S-12603	L18	Phono Oscillator Coil	.75
S-15691	L5	F. M. Oscillator Coil Assembly	.40
S-15743	L3	F. M. Detector Coil Assembly	.65
S-16344	L4	Broadcast Det. Coil Assembly	.60
S-16345	L6	Broadcast Osc. Coil Assembly	.60
S-16408	L2	Antenna Choke Coil Assembly	.25

CONDENSERS

22-3	C7	.01 Mfd. Ceramic (10 used)	500V	.26
22-4	C21	.004 Mfd. Ceramic	500V	.26
22-5	C8	110 Mmfd. Ceramic (or 22-1669) (3 used)	500V	.26
22-177	C19	.2 Mfd.	400V	.33
22-448	C17	.004 Mfd.	600V	.20
22-669	C22	.01 Mfd.	600V	.20
22-827	C15	.1 Mfd.	600V	.23
22-829	C5	.05 Mfd. (3 used)	200V	.20
22-854	C24	.0005 Mfd.	600V	.20
22-1220	C14	.002 Mfd.	600V	.20
22-1367	C13	50 Mmfd. Ceramic (2 used)	500V	.33
22-1506	C10	22 Mmfd. Ceramic (2 used)	500V	.33
22-1676	C11	.001 Mfd. Ceramic (4 used)	500V	.40
22-1705	C9	30 Mmfd. Ceramic	500V	.20
22-1717	C20	.001 Mfd.	200V	.20
22-1762	C12	1 Mmfd. (Molded) Ceramic	500V	.20
22-1775	C18	.047 Mfd.	400V	.26
22-2104	C1	Variable - 3 Section		3.80
22-2105	C26,27	Elect. 80-40 Mfd. 250V		3.00
22-2140	C6	15 Mmfd. Ceramic (3 used)	500V	.20
22-2154	C25	Elect. Cond. 10 Mfd. 250V		1.25
22-2240	C16	Trimmer Condenser		.40

RESISTORS

63-1726	R33	39 Ohm	1/2W	10%	Ins.	Res.	.21
63-1737	R2	68 Ohm	1/2W	20%	Ins.	Res.	.21
63-1744	R14	100 Ohm	1/2W	20%	Ins.	Res.	.21
63-1758	R1	220 Ohm	1/2W	20%	Ins.	Res. (5 used)	.21
63-1768	R4	390 Ohm	1/2W	10%	Ins.	Res.	.21
63-1772	R6	470 Ohm	1/2W	20%	Ins.	Res.	.21
63-1782	R21	820 Ohm	1/2W	10%	Ins.	Res.	.21
63-1806	R25	3300 Ohm	1/2W	10%	Ins.	Res.	.21
63-1814	R17	4700 Ohm	1/2W	20%	Ins.	Res.	.21
63-1827	R5	10K Ohm	1/2W	10%	Ins.	Res.	.21
63-1828	R29	10K Ohm	1/2W	20%	Ins.	Res.	.21
63-1834	R28	15K Ohm	1/2W	10%	Ins.	Res.	.21
63-1845	R24	27K Ohm	1/2W	10%	Ins.	Res.	.21
63-1856	R10	47K Ohm	1/2W	20%	Ins.	Res. (3 used)	.21
63-1863	R16	68K Ohm	1/2W	20%	Ins.	Res.	.21
63-1869	R31	100K Ohm	1/2W	10%	Ins.	Res.	.21
63-1870	R20	100K Ohm	1/2W	20%	Ins.	Res.	.21

RESISTORS Continued

63-1876	R30	150K Ohm	1/2W	10%	Ins.	Res. (2 used)	.21
63-1884	R8	220K Ohm	1/2W	20%	Ins.	Res. (2 used)	.21
63-1898	R9	470K Ohm	1/2W	20%	Ins.	Res. (3 used)	.21
63-1912	R12	1 Megohm	1/2W	20%	Ins.	Res. (2 used)	.21
63-1926	R7	2.2 "	1/2W	20%	Ins.	Res.	.21
63-1940	R32	4.7 "	1/2W	20%	Ins.	Res.	.21
63-1947	R3	6.8 "	1/2W	20%	Ins.	Res. (2 used)	.21
63-1954	R13	10 "	1/2W	20%	Ins.	Res.	.21
63-1981	R26	120 Ohm	1W	10%	Ins.	Res.	.24
63-2068	R18,19	Candohm - Two Section					1.00
63-2091	R15	820 Ohm W.W.	1/2W	20%	Ins.	Res.	.21
63-2093	R27	47 Ohm W.W.	1W	10%	Ins.	Res.	.24
63-2131	R22	Volume Control & Switch					1.81
63-2132	R34	Tone Control					1.20

MISCELLANEOUS

44-25		Phono Jack	.12
54-139		3/8-32 x 9/16 Palnut Cad. (1 ea. used on 63-2131 & 63-2132)	.01
54-271		6-32 x 1/4" Palnut Steel Cad. (1 ea. used on 95-1102, 95-1150, 95-1152 & 95-1153)	.01
58-128		Two Prong Plug (A-C Interlock)	.15
78-755		Octal Tube Socket (2 used)	.18
78-807		Miniature Tube Socket	.15
78-854		Miniature Tube Socket (9 Contact)	.35
78-869		Miniature Tube Socket	.20
78-870		Miniature Tube Socket (2 used)	.15
78-871		Miniature Tube Socket	.15
78-896		Three Contact Socket	.10
80-780		Iron Core Tension Spring	.05
85-489	S-1	Band Switch	3.00
93-993		Insulating Washer (used on 63-2132)	.02
93-1039		Gang Mtg. Cup Washer (2 used)	.01
95-1188	T6	Auto Trans.	4.30
95-1189	T5	Speaker Output Trans.	2.25
149-95		Iron Core & Spring	.30
S-16838		Speaker Cable & Eyelet Assembly	.35

CABINET PARTS

2-196		Cabinet Back (Phono Section)	.40
11-106		Line Cord & Plug (9 ft. long)	.80
14-1268R		Cabinet for H880RZ Console Comb. Model	---
16-632		Packing Carton	---
46-873		Tone Control Knob	.10
46-876		Tuning Knob	.15
46-899		Band Switch Knob	.15
49-688	SP-1	10" P. M. Speaker	8.50
		ZC-1061 Cone	3.41
57-1481		Esc. Clamping Ring (4 used)	.02
57-1658		Escutcheon	4.00
70-86		#6 x 5/8 Washer Hd. Wood Screw Steel Stat. Br. (12 used)to Mt. Backs)	.60C
78-847		Two Contact Socket	.10
80-604		Hinge Spring (2 used)	.15
93-1059		Felt Washer (used on 46-873)	.01
97-293		Chassis Mtg. Ins. Stud (3 used)	.18
114-128		#10 x 1/16" Hex. Washer Hd. S. T. (3 used Chassis Mtg.)	1.81C
114-350		#8 x 7/16" Hex. Hd. Sl. S. T. (4 used on 57-1658)	.02
159-50		Cinch Plug Button (4 used on 192-138)	.01
165-9		Glides (2 used)	.03
165-14		Glides (2 used)	.03
188-54		Knob Clamping Ring (46-876)	.02
192-138		Dial Glass	.50
202-697		F. M. Instruction Book	.10
202-840		Radio & Phono Instruction Book	.25
S-14025		Record Changer Assembly	---
S-15536		Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15780		Cobra Tone Arm Cartridge Assembly	3.50
S-16196		Record Changer Mtg. Frame & Arm Assembly	8.00
S-16419		Package of 6 - 45 RPM Center Hole Adaptors	.60
S-16841	L1	Low Impedance Loop & Clip Assembly	.60
S-17167		Volume Control Knob Assembly	.25
S-17169		Cabinet Back Assembly (Radio Section)	2.50
S-17328	L19	Loop Loading Coil Assembly	.65

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 13, 14	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 Prim. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

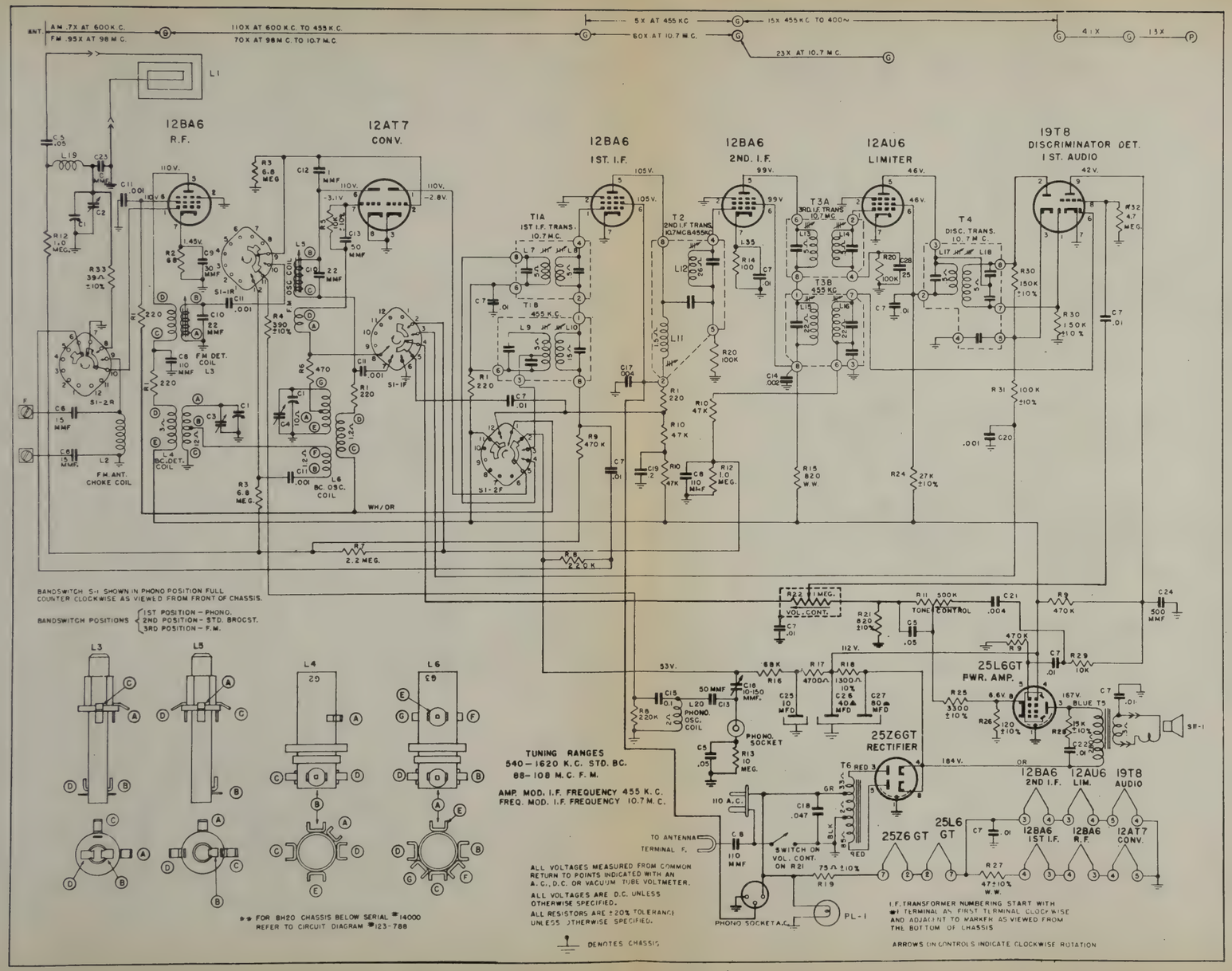
The signal generator output should be kept just high enough to get an indication on the meter.

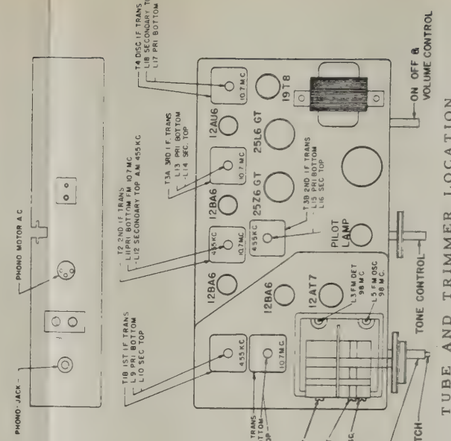
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

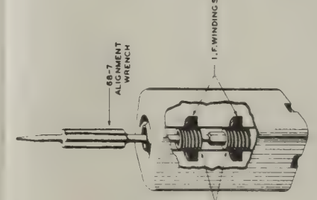
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

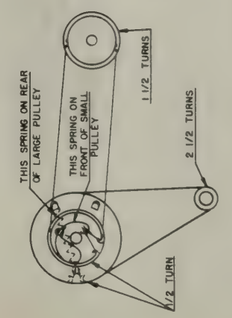
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.


ANT.
AM .7X AT 600K.C.
FM .95X AT 98 M.C.
110X AT 600 K.C. TO 455 K.C.
70X AT 98 M.C. TO 10.7 M.C.
5X AT 455 KC
60X AT 10.7 M.C.
15X 455 K.C. TO 400 K
23X AT 10.7 M.C.
4.1X
13X
12BA6 R.F.
12AT7 CONV.
12BA6 1ST. I.F.
12BA6 2ND. I.F.
12AU6 LIMITER
19T8 DISCRIMINATOR DET. 1ST. AUDIO
T1A 1ST I.F. TRANS. 10.7MC.
T1B 455 K.C.
T2 2ND I.F. TRANS. K17MCB455KC
T3A 3RD I.F. TRANS 10.7MC
T3B 455 KC
T4 DISC. TRANS. 10.7 M.C.
L1
L2 FM ANT. CHOKE COIL
L3 FM DET. COIL
L4 BC. DET. COIL
L5 OSC. COIL
L6 BC. OSC. COIL
S1-2R
S1-1R
S1-2F
S1-1F
WH/OR
BANDSWITCH S-1 SHOWN IN PHONO POSITION FULL COUNTER CLOCKWISE AS VIEWED FROM FRONT OF CHASSIS.
BANDSWITCH POSITIONS
1ST POSITION – PHONO.
2ND POSITION – STD. BROCST.
3RD POSITION – F.M.
VOL. CONT.
TONE CONTROL
25L6GT PWR. AMP.
25Z6GT RECTIFIER
PHONO SOCKET
TUNING RANGES
540 – 1620 K.C. STD. BC.
88 – 108 M.C. F.M.
AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7 M.C.
TO ANTENNA TERMINAL F.
SWITCH ON VOL. CONT. ON R21
PHONO SOCKET A.C.
PL-1
SP-1
12BA6 2ND I.F.
12AU6 LIM.
19T8 AUDIO
12BA6 1ST I.F.
12BA6 R.F.
12AT7 CONV.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
I.F. TRANSFORMER NUMBERING START WITH #1 TERMINAL AS FIRST TERMINAL CLOCKWISE AND ADJACENT TO MARKER AS VIEWED FROM THE BOTTOM OF CHASSIS
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION
** FOR 8H20 CHASSIS BELOW SERIAL #14000 REFER TO CIRCUIT DIAGRAM #123-788







TO THE SERVICE MAN:

The 8H20 revised chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all Bands.

When adjustments are made on the 8H20 revised chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the A.C voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an I F transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I F transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below,

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 12 15 & 16	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L18 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L13 and L14 Pri. & Sec. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adjust L11 for maximum reading.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary

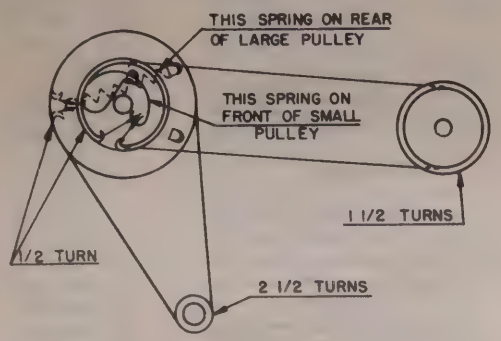
The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

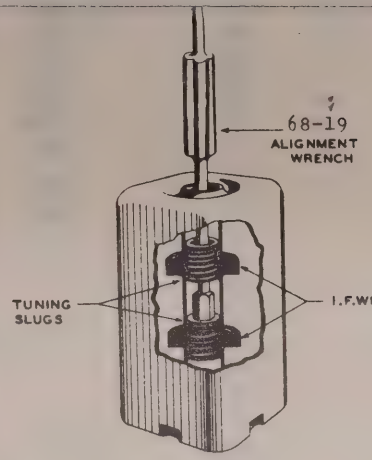
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

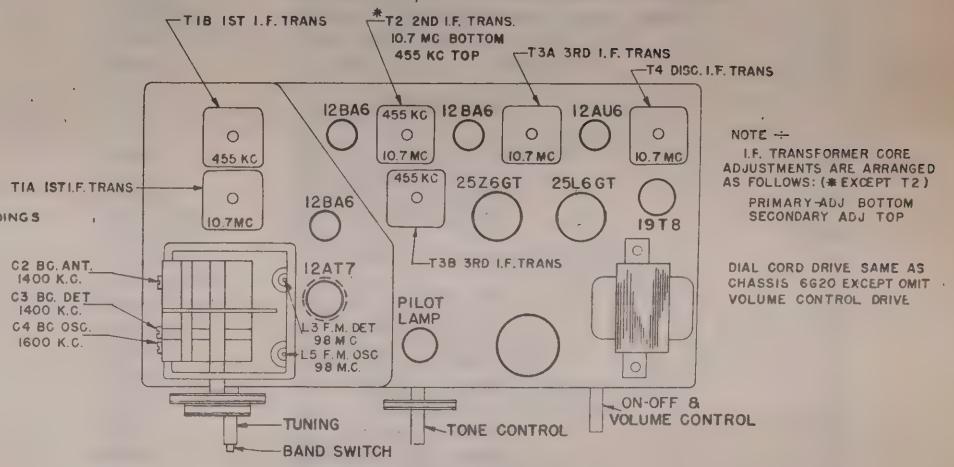
(d) Loosen Slugs by applying a hot iron to the cement.



DIAL CORD DRIVE



Detail of
IF Transformer



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 8H20Z chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all Bands.

When adjustments are made on the 8H20Z chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

FM RF Alignment: The tunning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

PARTS LIST

Dial Assembly

54-292	Speed Nut (used on S-17165)	.01
78-895	Dial Light Socket & Wire	.45
80-69	Dial Cord Spring	.05
80-746	Pulley Retaining Spring	.02
80-747	Dial Cord Spring	.10
80-781	Tuner Arm Tension Spring	.06
94-732	Pointer Pulley Bushing (Part of S-17165)	.30
100-97 PL-1	Pilot Light Bulb	.25
114-262	#8 x 7/16" Hex Hd. Sl. S.T. (2 used to mount S-17149)	.02
114-297	#6 x 1/4" Hex Hd. Sl. S.T. (2 used to mount S-17165)	.01
148-122	Tuner Arm	.20
188-30	Retaining Ring (used on S-17155)	.02
S-17149	Dial Scale & Bracket Assembly (26-449 & 26-450)	1.50
S-17155	Tuning Shaft & Pulley Assembly	.35
S-17157	Pointer & Pulley Assembly	.55
S-17158	Dial Cord & Eyelet Assembly (Long)	.07
S-17159	Dial Cord & Eyelet Assembly (Short)	.06
S-17165	Bracket & Pulley Bushing Assembly	.35

Coils & Chokes

95-1251 T2	2nd. IF Transformer 10.7 Mc & 455 Kc	
95-1102 T3B	3rd. IF Transformer	1.60
95-1150 T3B	3rd. IF Transformer	1.50
95-1153 T4	Disc. Transformer	1.50
95-1248 T1B	1st. IF Transformer	1.60
95-1201 T1A	1st. IF Transformer	1.50
S-12603 L18	Phono Oscillator Coil	.75
S-15691 L5	F.M. Oscillator Coil Assembly	.40
S-15743 L3	F.M. Detector Coil Assembly	.65
S-16344 L4	Broadcast Det. Coil Assembly	.60
S-16345 L6	Broadcast Osc. Coil Assembly	.60
S-16408 L2	Antenna Choke Coil Assembly	.25

Condensers

22-3	C7	.01 Mfd. Ceramic (10 used)	500V	.26
22-4	C21	.004 Mfd. Ceramic	500V	.26
22-5	C8	110 Mmfd. Ceramic (or 22-1669) (3 used)	500V	.26
22-177	C19	.2 Mfd.	400V	.33
22-448	C17	.004 Mfd.	600V	.20
22-669	C22	.01 Mfd.	600V	.20
22-927	C15	.1 Mfd.	600V	.23
22-829	C5	.05 Mfd. (3 used)	200V	.20
22-854	C24	.0005Mfd.	600V	.20
22-1220	C14	.002 Mfd.	600V	.20
22-1367	C13	50 Mmfd. Ceramic (2 used)	500V	.33
22-1506	C10	22 Mmfd. Ceramic (2 used)	500V	.33
22-1676	C11	.001 Mfd. Ceramic (4 used)	500V	.40
22-1705	C9	30 Mmfd. Ceramic	500V	.20
22-1717	C20	.001 Mfd.	200V	.20
22-1762	C12	1 Mmfd.(molded) (Ceramic)	500V	.20
22-1775	C18	.047 Mfd.	400V	.26
22-2104	C1	Variable - 3 Section		3.80
22-2105	C26,27	Elect. 80-40 Mfd. 250V		3.00
22-2140	C6	15 Mmfd. Ceramic (3 used)	500V	.20
22-2154	C25	Elect. Cond. 10 Mfd. 250V		1.25
22-2240	C16	Trimmer Condenser		.40
22-1507	C28	25 Mmfd. Ceramic	500V	

Resistors

63-1726	R33	39 ohm	1/2W	10%	Ins. Res.	.21
63-1737	R2	68 ohm	1/2W	20%	Ins. Res.	.21
63-1744	R14	100 ohm	1/2W	20%	Ins. Res.	.21
63-1758	R1	220 ohm	1/2W	20%	Ins. Res. (5 used)	.21
63-1768	R4	390 ohm	1/2W	10%	Ins. Res.	.21
63-1772	R6	470 ohm	1/2W	20%	Ins. Res.	.21
63-1782	R21	820 ohm	1/2W	10%	Ins. Res.	.21
63-1806	R25	3300ohm	1/2W	10%	Ins. Res.	.21
63-1814	R17	4700ohm	1/2W	20%	Ins. Res.	.21
63-1827	R5	10K ohm	1/2W	10%	Ins. Res.	.21
63-1829	R29	10K ohm	1/2W	20%	Ins. Res.	.21
63-1834	R28	15K ohm	1/2W	10%	Ins. Res.	.21
63-1845	R24	27K ohm	1/2W	10%	Ins. Res.	.21
63-1856	R10	47K ohm	1/2W	20%	Ins. Res. (3 used)	.21
63-1863	R16	68K ohm	1/2W	20%	Ins. Res.	.21
63-1869	R31	100Kohm	1/2W	10%	Ins. Res.	.21
63-1870	R20	100Kohm	1/2W	20%	Ins. Res.	.21
63-1876	R30	150Kohm	1/2W	10%	Ins. Res. (2 used)	.21
63-1884	R8	220Kohm	1/2W	20%	Ins. Res. (2 used)	.21
63-1898	R9	470Kohm	1/2W	20%	Ins. Res. (3 used)	.21

Resistors (Cont'd.)

63-1912	R12	1 Megohm	1/2W	20%	Ins. Res. (2 used)	.21
63-1926	R7	2.2 "	1/2W	20%	Ins. Res.	.21
63-1940	R32	4.7 "	1/2W	20%	Ins. Res.	.21
63-1947	R3	6.8 "	1/2W	20%	Ins. Res. (2 used)	.21
63-1954	R13	10 "	1/2W	20%	Ins. Res.	.21
63-1981	R26	120 ohm	1W	10%	Ins. Res.	.24
63-2068	R18,19	Candohm - Two Section				1.00
63-2091	R15	820 ohm W.W.	1/2W	20%	Ins. Res.	.21
63-2093	R27	47 ohm W.W.	1W	10%	Ins. Res.	.24
63-2131	R22	Volume Control & Switch				1.81
63-2132	R11	Tone Control				1.20

Miscellaneous

44-25	Phono Jack	.12
54-139	3/8-32 x 9/16 Palnut Cad. (1 ea. used on 63-2131 & 63-2132)	.01
54-271	6-32 x 1/4" Palnut Steel Cad. (1ea. used on 95-1102, 95-1150, 95-1152 & 95-1153)	.01
58-128	Two Prong Plug (A-C Interlock)	.15
78-755	Octal Tube Socket (2 used)	.18
78-807	Miniature Tube Socket	.15
78-854	Miniature Tube Socket (9 contact)	.35
78-869	Miniature Tube Socket	.20
78-870	Miniature Tube Socket (2 used)	.15
78-871	Miniature Tube Socket	.15
78-896	Three Contact Socket	.10
80-780	Iron Core Tension Spring	.05
85-489 S-1	Band Switch	3.00
93-993	Insulating Washer (used on 63-2132)	.02
93-1039	Gang Mtg. Cup Washer (2 used)	.01
95-1188 T6	Auto Trans.	4.30
95-1189 T5	Speaker Output Trans.	2.25
149-95	Iron Core & Spring	.30
S-16838	Speaker Cable & Eyelet Assembly	.35

Cabinet Parts

2-196	Cabinet Back (Phono Section)	.40
11-106	Line Cord & Plug (9 ft. long)	.80
14-1254R	Cabinet for H880R Console Comb. Model	---
14-1254	Cabinet for H880 Console Combination Model	---
16-632	Packing Carton	---
19-169	Record Changer Mounting Clip	---
46-872	Dummy Knob	---
46-873	Tone Control Knob	.10
46-876	Tuning Knob	.15
46-877	Volume Control Knob	---
46-899	Band Switch Knob	.15
49-688 SP-1	10" P.M. Speaker ZC-1061 Cone	8.50 3.41
57-1481	Esc. Clamping Ring (4 used)	.02
57-1658	Escutcneon	4.00
70-86	#6 x 5/8 Washer Hd. Wood Screw Steel Stat. Br. (12 used) to Mt. Backs)	.60C
78-847	Two Contact Socket	.10
80-604	Hinge Spring (2 used)	.15
93-1059	Felt Washer (used on 46-873)	.01
97-293	Chassis Mtg. Ins. Stud (3 used)	.18
112-809	Record Changer Mtg. Screw (3 used)	
114-128	#10 x 1/16" Hex Washer Hd. S.T. (3 used Chassis Mtg.)	1.81C
114-350	#8 x 7/16" Hex Hd. Sl. S.T. (4 used on 57-1658)	.02
125-56	Rubber Grommet (4 used Speaker Mtg.)	---
156-35	Bullet Catch	---
159-50	Cinch Plug Button (4 used on 192-138)	.01
165-9	Glides (2 used)	.03
165-14	Glides (2 used)	.03
188-54	Knob Clamping Ring (46-876)	.02
192-138	Dial Glass	.50
202-697	F.M. Instruction Book	.10
202-828	Radio & Phono Instruction Book	.25
S-14029	Record Changer Variable Speed	---
S-15536	Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15780	Cobra Tone Arm Cartridge Assembly	3.50
S-17005	Record Changer Mtg. Frame & Arm Assembly	8.00
S-16419	Package of 6 - 45 RPM Center Hole Adaptors	.60
S-16841 L1	Low Impedance Loop & Clip Assembly	.60
S-17167	Volume Control Knob Assembly	.25
S-17169	Cabinet Back Assembly (Radio Section)	2.50
S-17328 L19	Loop Loading Coil Assembly	.65

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 12 15 & 16	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L18 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L13 and L14 Pri. & Sec. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adjust L11 for maximum reading.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

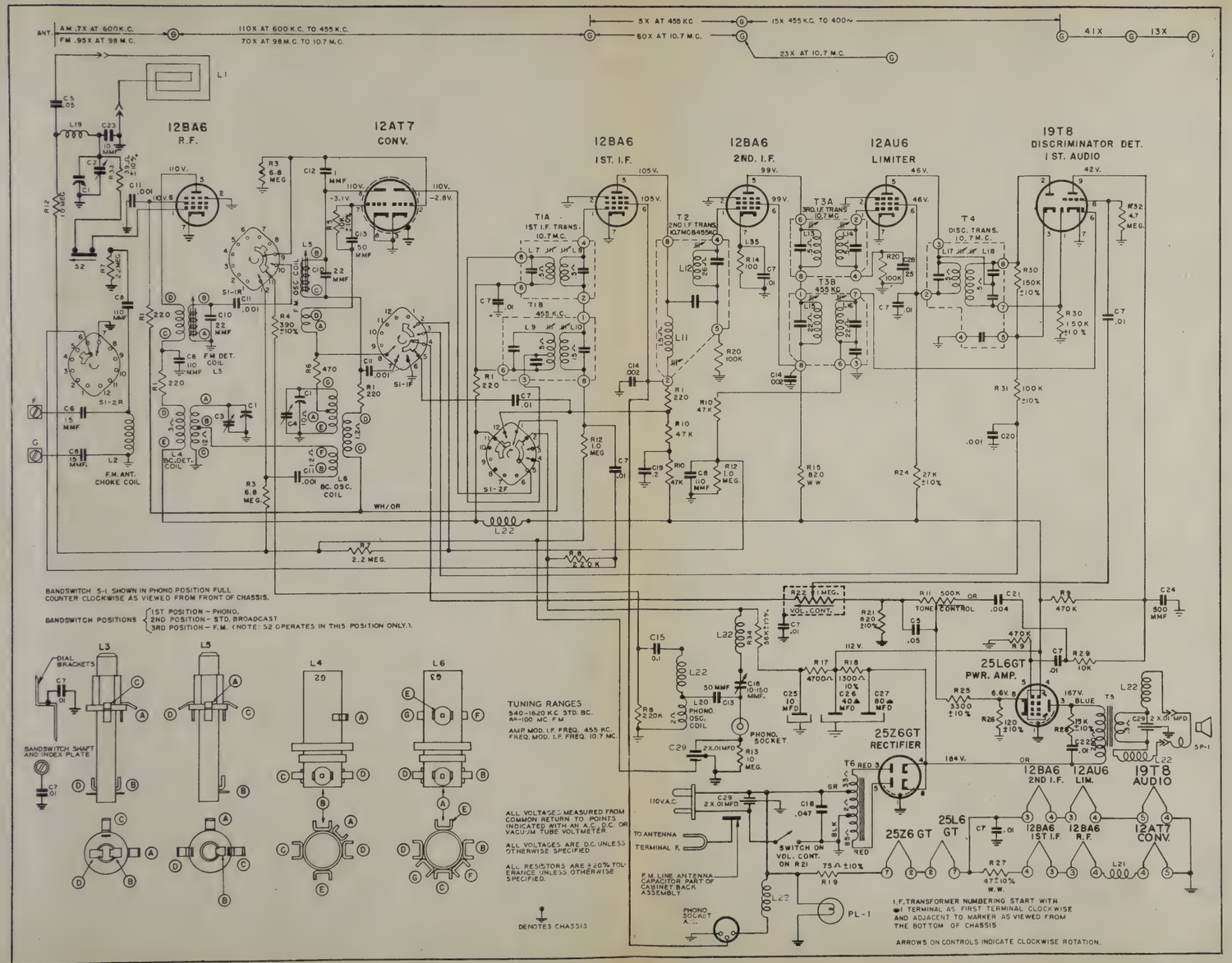
The signal generator output should be kept just high enough to get an indication on the meter.

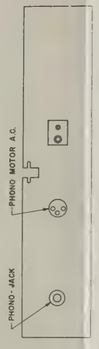
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

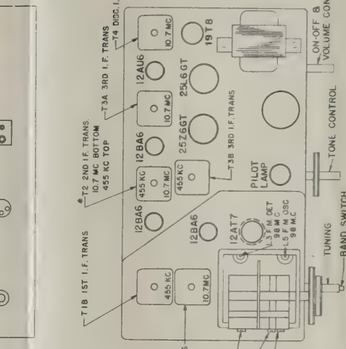
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

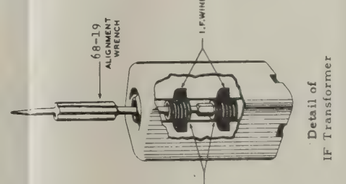
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

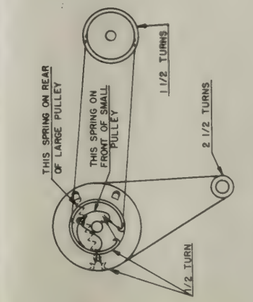





T2 2ND I.F. TRANS 10.7 MC BOTTOM 455 KC TOP
T3A 3RD I.F. TRANS
T4 DISC. I.F. TRANS
NOTE – I.F. TRANSFORMER CORE ADJUSTMENTS ARE ARRANGED AS FOLLOWS: (● EXCEPT T2) PRIMARY ADJ. TOP SECONDARY ADJ. BOTTOM
DIAL CORD DRIVE SAME AS CHASSIS 6S20 EXCEPT OMIT VOLUME CONTROL DRIVE
ON-OFF & VOLUME CONTROL
TONE CONTROL
TUNING
BAND SWITCH
T1A 1ST I.F. TRANS
T1B 1ST I.F. TRANS
T3B 3RD I.F. TRANS
PILOT LAMP
C2 BC. ANT. C3 BC. DET. 1400 K.C. C4 BC. OSC. 1600 K.C.
C5 F.M. DET. 3.8 M.C. C6 F.M. ANT. 3.5 F.M. OSC. 98 M.C.



Detail of IF Transformer



DIAL CORD DRIVE

TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 8H20Z chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all Bands.

When adjustments are made on the 8H20Z chassis, a line isolation transformer (110 V input to 110V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground and if there is any indication of voltage, reverse the plug before handling the set.

FM RF Alignment: The tunning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM IF Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF transformers the tuning wrench 6S-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 12 15 & 16	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L18 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L13 and L14 Pri. & Sec. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adjust L11 for maximum reading.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

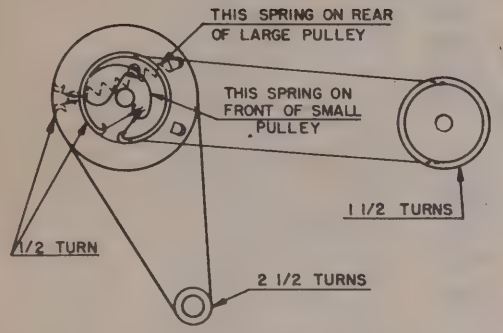
The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

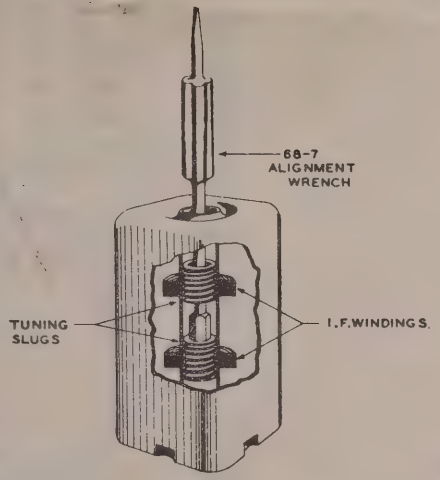
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

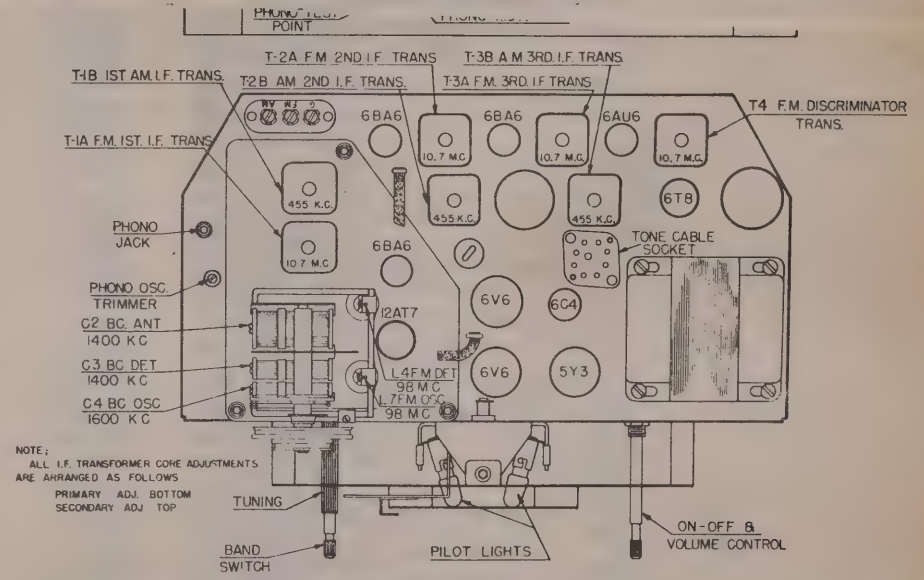
(d) Loosen Slugs by applying a hot iron to the cement.



DIAL CORD DRIVE



Detail of IF Transformer



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 10H20 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on all Bands.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same

MODEL H1083E, H1086R, H1087R CHASSIS 10H20

PARTS LIST

Part No.	Diag. No.	Description	Price
		Dial Assembly	
78-895		Dial Light Socket & Wire	.45
80-69		Dial Cord Spring	.05
80-746		Pulley Retaining Spring	.02
80-747		Dial Cord Spring	.10
100-97	PL-1	Pilot Light Bulb	
114-262		8-32x7/16"x1/4" A.F. Hex Hd. S.T. (2 used on S-17149)	.02
114-297		6-32x1/4" lg. x 1/4" A.F. Hex Hd. (2 used on S-17165)	.01
148-122		Tuner Arm	.20
188-30		Retaining Ring (used on S-17155)	.02
S-17149		Dial Scale & Brkt. Assem.	1.50
S-17155		Tuning Shaft & Pulley Assem.	.35
S-17157		Pointer & Pulley Assem.	.55
S-17158		Dial Cord & Eyelet Assem. (Long)	.07
S-17159		Dial Cord & Eyelet Assem. (Short)	.06
S-17165		Brkt. & Pulley Bushing Assem.	.35
		Coils & Chokes	
20-337	L22	R. F. Choke Coil (6 used)	.20
95-1102	T3B	2nd I. F. Transformer	1.60
95-1150	T3B	2nd I. F. Transformer	1.50
95-1153	T4	Discriminator Transformer	1.50
95-1201	T1A	1st I. F. Transformer	1.50
95-1248	T1B	1st I. F. Transformer	1.60
95-1251	T2	2nd I. F. Transformer	1.65
S-12603	L20	Phono Oscillator Coil Assem.	.75
S-13997	L21	Filament Choke Coil Assem.	.40
S-15691	L5	F. M. Oscillator	.40
S-15743	L3	F. M. Detector Coil Assem.	.65
S-16344	L4	Broadcast Detector Coil Assem.	.60
S-16345	L6	Broadcast Osc. Coil Assem.	.60
S-16408	L2	Antenna Choke Coil Assem.	.25
		Condensers	
22-3	C7	.01 Mfd. Ceramic (11 used) 500V	.26
22-4	C21	.004 Mfd. Ceramic 500V	.26
22-5	C8	110 Mmfd. Ceramic (or 22-1669) (3 used) 500V	.26
22-177	C19	.2 Mfd. 400V	.33
22-669	C22	.01 Mfd. 600V	.20
22-827	C15	.1 Mfd. 200V	.23
22-829	C5	.05 Mfd. (2 used) 200V	.20
22-854	C24	.0005 Mfd. 600V	.20
22-1220	C14	.002 Mfd. (2 used) 600V	.20
22-1367	C13	50 Mmfd.Ceramic (2 used) 500V	.33
22-1506	C10	22 Mmfd.Ceramic (2 used) 500V	.33
22-1507	C28	25 Mmfd.Ceramic 500V	.33
22-1676	C11	.001 Mfd. Ceramic (4 used) 500V	.40
22-1717	C20	.001 Mfd. 200V	.20
22-1762	C12	1 Mmfd. Ceramic 500V	.20
22-1775	C18	.047 Mfd. (Molded) 400V	.26
22-1863	C23	10 Mmfd. Ceramic 500V	.25
22-2104	C1	Three Section Variable	3.80
22-2105	C26,C27	Elect. 80-40 250V	3.00
22-2140	C6	15 Mmfd. Ceramic (2 used) 500V	.20
22-2154	C25	Elect. 10 Mfd. 250V	1.25
22-2240	C16	Trimmer Cond.	.40
22-2276	C29	Dual Ceramic .01 Mfd. - .01 Mfd. (3 used) 500V	.50
		Resistors	
63-1726	R33	39 Ohm 1/2W 10% Ins. Res.	.21
63-1744	R14	100 Ohm 1/2W 20% Ins. Res.	.21
63-1758	R1	220 Ohm 1/2W 20% (5 used) Ins. Res.	.21
63-1768	R4	390 Ohm 1/2W 10% Ins. Res.	.21
63-1772	R6	470 Ohm 1/2W 20% Ins. Res.	.21
63-1782	R21	820 Ohm 1/2W 10% Ins. Res.	.21
63-1806	R25	3300 Ohm 1/2W 10% Ins. Res.	.21
63-1814	R17	4700 Ohm 1/2W 20% Ins. Res.	.21
63-1827	R5	10K Ohm 1/2W 10% Ins. Res.	.21
63-1828	R29	10K Ohm 1/2W 20% Ins. Res.	.21
63-1834	R28	15K Ohm 1/2W 10% Ins. Res.	.21
63-1845	R24	27K Ohm 1/2W 10% Ins. Res.	.21
63-1856	R10	47K Ohm 1/2W 20% (3 used) Ins. Res.	.21
63-1859	R34	56K Ohm 1/2W 10% Ins. Res.	.21
63-1869	R31	100K Ohm 1/2W 10% Ins. Res.	.21
63-1870	R20	100K Ohm 1/2W 20% (2 used) Ins. Res.	.21
63-1876	R30	150K Ohm 1/2W 10% (2 used) Ins. Res.	.21
63-1884	R8	220K Ohm 1/2W 20% (2 used) Ins. Res.	.21
63-1898	R9	470K Ohm 1/2W 20% (2 used) Ins. Res.	.21
63-1912	R12	1 Megohm 1/2W 20% (3 used) Ins. Res.	.21
63-1926	R7	2.2 Megohm 1/2W 20% (2 used) Ins. Res.	.21

Part No.	Diag. No.	Description	Price
		Resistors (Cont'd.)	
63-1940	R32	4.7 Megohm 1/2W 20% Ins. Res.	.21
63-1947	R3	6.8 Megohm 1/2W 20% (2 used) Ins. Res.	.21
63-1954	R13	10 Megohm 1/2W 20% Ins. Res.	.21
63-1981	R26	120 Ohm 1W 10% Ins. Res.	.24
63-2068	R18,R19	Two Section Candohm	1.00
63-2091	R15	820 Ohm W.W. 1/2W 20% Ins. Res.	.21
63-2131	R22	Volume Control & Switch	1.81
63-2132	R11	Tone Control	1.20
63-2428	R27	82 Ohm W.W. 2W 10% Ins. Res.	
		Miscellaneous	
44-25		Phono Jack	.12
54-139		3/8-32x9/16 Palnut (1 ea. used on 63-2131 & 63-2132)	.01
54-271		6-32x1/4" Palnut Steel Cad. (1 ea. used on 95-1102-1150-1251-1153 & 2 ea. used on 95-1201 & 1248)	.01
58-128		Two Prong Plug	.15
78-755		Octal Tube Socket (2 used)	.18
78-869		Miniature Tube Socket	.20
78-870		Miniature Tube Socket (3 used)	.15
78-871		Miniature Tube Socket	.15
78-896		Three Contact Socket	.10
78-903		Miniature Tube Socket (9 contact)	.30
80-780		Iron Core Tension Spring (3 used)	.05
80-781		Tuner Arm Tension Spring	.06
80-865		Ground Spring (2 used)	.05
80-868		Ground Spring (2 used)	.15
85-505	S-2	S.P.D.T. Switch (ant.)	.90
85-506	S-1	Band Switch	
93-1039		Gang Mtg. Cup Washer (2 used)	.01
95-1188	T6	Auto Trans.	4.30
95-1272	T5	Speaker Output Trans.	
126-618		Miniature Tube Shield	.02
149-95		Iron Core & Spring	.30
S-16838		Speaker Cable & Eyelet Assem.	.35
		Cabinet Parts	
2-196		Cabinet Back (Phono Section)	.40
11-106		Line Cord & Plug (9 ft. long)	.80
14-1254R		Cabinet for H880R Console Comb. Model	
14-1254		Cabinet for H880 Console Combination Model	
16-632		Packing Carton	
19-169		Record Changer Mounting Clip	
46-872		Dummy Knob	
46-873		Tone Control Knob	.10
46-876		Tuning Knob	.15
46-877		Volume Control Knob	
46-899		Band Switch Knob	.15
49-702	SP-1	10" P.M. Speaker	8.50
		ZC-1061 Cone	3.41
57-1481		Esc. Clamping Ring (4 used)	.02
57-1658		Escutcheon	4.00
57-1731		Chassis Bottom Plate	
70-86		#6 x 5/8 Washer Hd. Wood Screw Steel Stat. Br. (12 used to Mt. Backs)	.60C
78-847		Two Contact Socket	.10
80-604		Hinge Spring (2 used)	.15
93-1059		Felt Washer (used on 46-873)	.01
97-293		Chassis Mtg. Ins. Stud (3 used)	.18
112-809		Record Changer Mtg. Screw (3 used)	
114-128		#10 x 1/16" Hex Washer Hd. S.T. (3 used Chassis Mtg.)	1.81C
114-350		#8 x 7/16" Hex Hd. Sl. S.T. (4 used on 57-1658)	.02
125-56		Rubber Grommet (4 used Speaker Mtg.)	
156-35		Bullet Catch	
159-50		Cinch Plug Button (4 used on 192-138)	.01
165-9		Glides (2 used)	.03
165-14		Glides (2 used)	.03
188-54		Knob Clamping Ring (46-876)	.02
192-138		Dial Glass	.50
202-697		F.M. Instruction Book	.10
202-878		Radio & Phono Instruction Book	.25
S-14029		Record Changer Variable Speed	
S-15536		Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15780		Cobra Tone Arm Cartridge Assembly	3.50
S-17005		Record Changer Mtg. Frame & Arm Assembly	8.00
S-16419		Package of 6 - 45 RPM Center Hole Adaptors	.60
S-16841	L1	Low Impedance Loop & Clip Assembly	.60
S-17167		Volume Control Knob Assembly	.25
S-17871		Cabinet Back Assembly (Radio Section)	2.50
S-17328	L19	Loop Loading Coil Assembly	.65

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 12 15 & 16	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L18 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L13 and L14 Pri. & Sec. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adjust L11 for maximum reading.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following prooedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

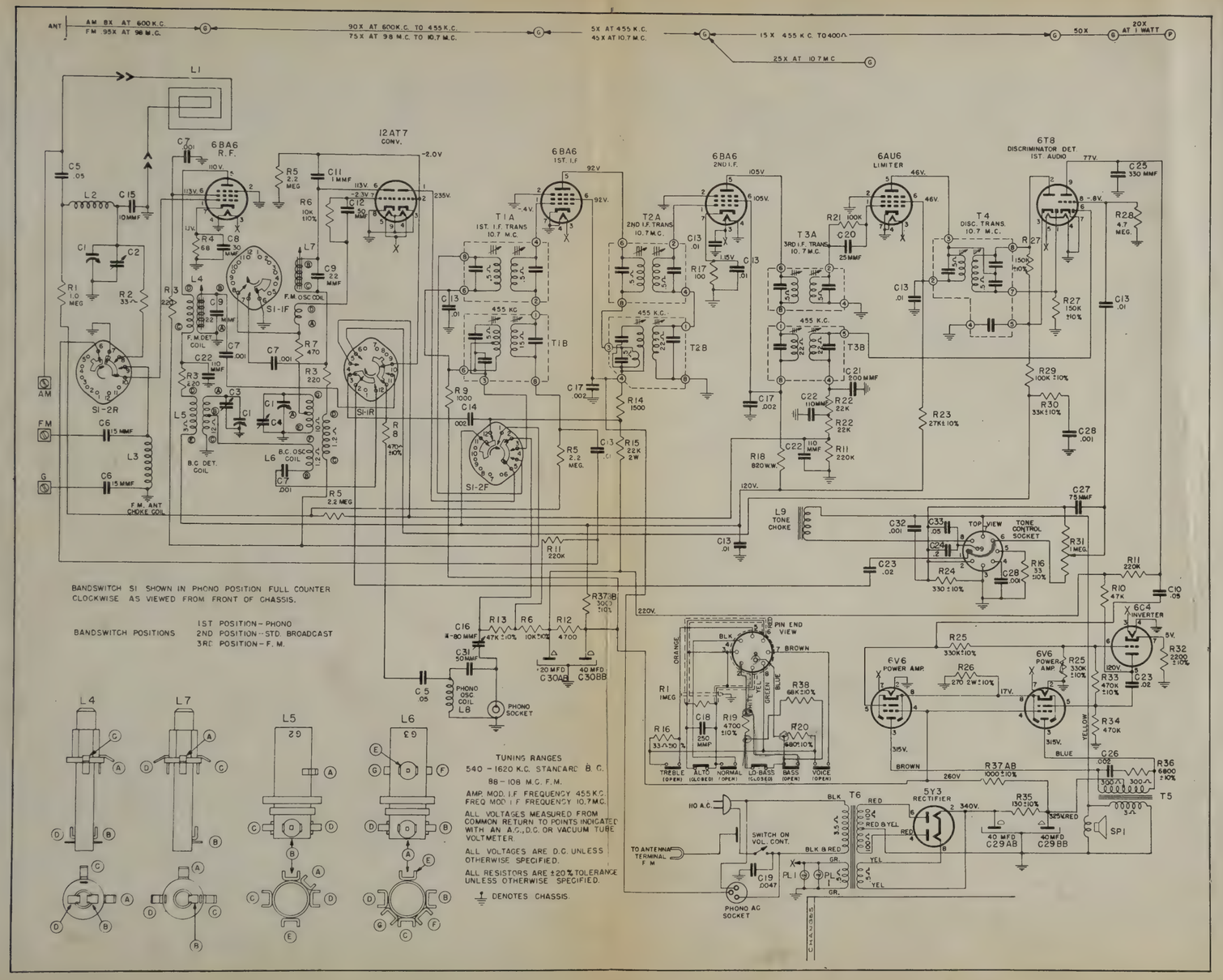
The signal generator output should be kept just high enough to get an indication on the meter.

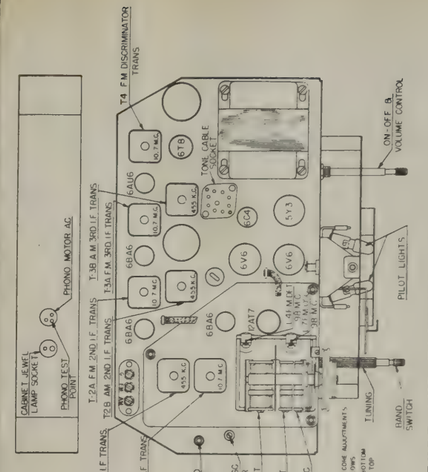
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

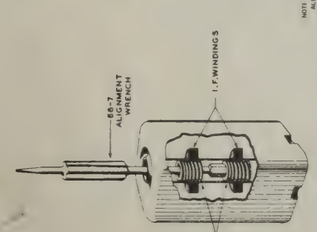
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

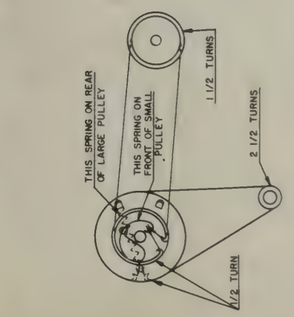



T4 F.M. DISCRIMINATOR TRANS
T3 A.M. 3RD I.F. TRANS
T3 F.M. 3RD I.F. TRANS
T2 A.M. 2ND I.F. TRANS
T2 F.M. 2ND I.F. TRANS
T1 A.M. 1ST I.F. TRANS
T1 F.M. 1ST I.F. TRANS
PHONO MOTOR AC
CABINET JEWEL LAMP SOCKET
PHONO TEST POINT
TONE CABLE SOCKET
ON-OFF & VOLUME CONTROL
PILOT LIGHTS
PHONO JACK
PHONO OSC. TRIMMER
.02 BC ANT 1500 KC
C3 BC OSC 1400 KC
C4 BC OSC 1600 KC
T. WIND
HAND SWITCH
NOTE: ALL I.F. TRANSFORMER CORE ADJUSTMENTS ARE MADE FROM BOTTOM OF CHASSIS. PRIMARY ADJ. BOTTOM SECONDARY ADJ. TOP

TUBE AND TRIMMER LOCATION



Detail of IF Transformer



DIAL CORD DRIVE

TO THE SERVICE MAN:

The 10H20 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on all Bands.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF transformers the tuning wrench 68-19 ca[illegible] be inserted into the top slug, rotated until maximum output is ob[illegible]ined and then dropped [illegible]

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same

	the lowe... Dial Light Socket & Wire	.35
S-17248	Radiorgan Knob & Eyelet Assembly (Alto)	.20
S-17249	Radiorgan Knob & Eyelet Assembly (Bass)	.20
S-17250	Radiorgan Knob & Eyelet Assembly (Lo-Bass)	.20
S-17251	Radiorgan Knob & Eyelet Assembly (Normal)	.20
S-17252	Radiorgan Esc. & Knob Assembly (R.H.)	1.55
S 17253	Radiorgan Esc. & Knob Assembly (L.H.)	1.55

15-79	Plug Cap & Insulator	.09
22-1745	250 Mmfd. Ceramic 500V	.20
S-17251	Radiorgan Knob & Eyelet Assembly (Normal)	.20
S-17252	Radiorgan Esc. & Knob Assembly (R.H.)	1.55
S 17253	Radiorgan Esc. & Knob Assembly (L.H.)	1.55

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	Adj. Pri. and Sec. T1B, T2B, T3B	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 6 AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Primary of Discriminator T4	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 6 AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Secondary of Discriminator T4	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6 BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T3A	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6 BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T2A	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T1A	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

In the event the receiver oscillates during phono operation, adjust C16 4-80 mmf. capacitor to a point at which the oscillation ceases.

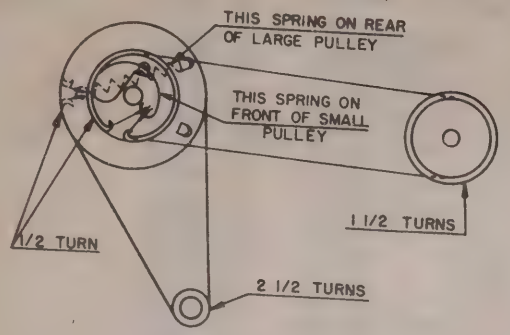
This position of no oscillation will sometimes vary with different cartridges, and in this case readjustment of C16 must be made.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (Half discriminator load).

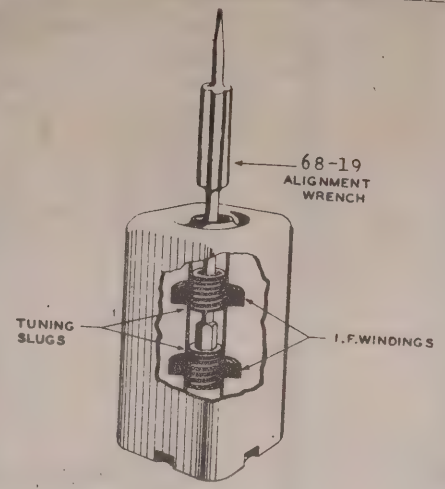
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (Full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

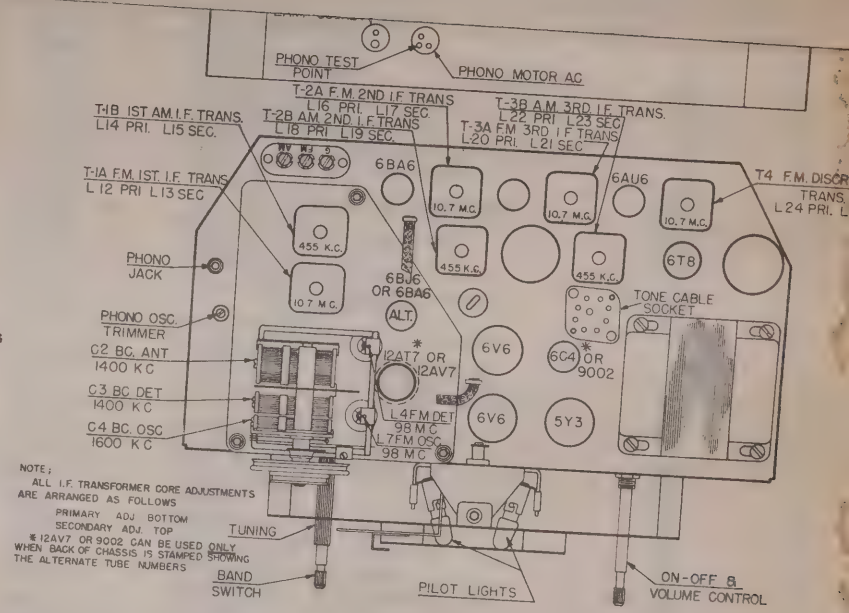
(d) Loosen Slugs by applying a hot iron to the cement



DIAL CORD DRIVE



Detail of IF Transformer


PHONO TEST POINT
PHONO MOTOR AC
T-1B IST AM I.F. TRANS. L14 PRI. L15 SEC.
T-2A F.M. 2ND I.F. TRANS L16 PRI. L17 SEC.
T-2B AM 2ND I.F. TRANS L18 PRI L19 SEC.
T-3B A.M. 3RD I.F. TRANS. L22 PRI L23 SEC.
T-3A FM 3RD I.F. TRANS L20 PRI. L21 SEC.
T-1A F.M. IST. I.F. TRANS L 12 PRI L13 SEC
6BA6
6AU6
T4 F.M. DISCR TRANS. L24 PRI. L
10.7 M.C.
455 K.C.
PHONO JACK
6BJ6 OR 6BA6
ALT.
6T8
TONE CABLE SOCKET
PHONO OSC. TRIMMER
C2 BC. ANT 1400 K.C.
C3 BC DET 1400 K.C.
C4 BC. OSC 1600 K.C.
12AT7 OR 12AV7
6V6
6C4 OR 9002
5Y3
L4 FM DET 98 M.C.
L7 FM OSC 98 M.C.
NOTE; ALL I.F. TRANSFORMER CORE ADJUSTMENTS ARE ARRANGED AS FOLLOWS
PRIMARY ADJ. BOTTOM
SECONDARY ADJ. TOP
* 12AV7 OR 9002 CAN BE USED ONLY WHEN BACK OF CHASSIS IS STAMPED SHOWING THE ALTERNATE TUBE NUMBERS
TUNING
BAND SWITCH
PILOT LIGHTS
ON-OFF & VOLUME CONTROL

TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 10H20Z chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on all Bands.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM Alignment: The AM and FM IF transformers in this reciever are of the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

78-898	Dial Light Socket & Wire		.35
80-69	Dial Cord Spring		.05
80-746	Pulley Retaining Spring (used on S-17157)		.02
80-747	Dial Cord Spring		.10
93-1061	Shoulder Washer (used on S-17258)		.02
100-67	Dial Light Bulb		.11
188-30	Retaining Ring (used on S-17155)		.02
S-17155	Tuning Shaft & Pulley Assembly		.35
S-17157	Pointer & Pulley Assembly (59-219)		.55
S-17158	Dial Cord & Eyelet Assembly (Long)		.07
S-17159	Dial Cord & Eyelet Assembly (Short)		.06
S-17258	Dial Scale & Brkt. Assem. (26-449 & 26-450)		1.50
S-17261	Brkt. & Pulley Assembly		.30

Coils & Chokes

95-1150	2nd. & 3rd. I. F. Trans. (FM) (2 used)	1.50
95-1153	Discriminator Trans.	1.50
95-1201	1st. I. F. Trans. (FM)	1.50
95-1248	1st. I. F. Trans. (BC)	1.60
95-1249	2nd. I. F. Trans. (BC)	1.60
95-1254	3rd. I. F. Trans. (BC)	1.60
S-12603	Phono Oscillator Coil	.75
S-13800	Tone Choke Assembly	.60
S-15691	F. M. Osc. Coil Assembly	.40
S-15743	F. M. Detector Coil Assembly	.65
S-16344	Broadcast Detector Coil Assembly	.60
S-16345	Broadcast Oscillator Coil Assembly	.60
S-16408	Antenna Choke Coil Assembly	.25

Condensers

22-3	C13	.01 Mfd.	Ceramic (7 used)	500V	.26
22-5	C22	110 Mmfd.	Ceramic (3 used) (or 22-1669)	500V	.26
22-171	C10	.05 Mfd.		600V	.33
22-178	C33	.05 Mfd.		200V	.20
22-348	C32	.001 Mfd.	(Molded)	500V	.26
22-492	C14	.002 Mfd.		600V	.20
22-829	C5	.05 Mfd.	(2 used)	200V	.20
22-830	C23	.02 Mfd.	(2 used)	600V	.20
22-1203	C28	.001 Mfd.	(2 used)	600V	.20
22-1220	C17	.002 Mfd.	(2 used)	600V	.20
22-1256	C27	75 Mmfd.	(Molded)	500V	.20
22-1367	C12	50 Mmfd.	Ceramic	500V	.33
22-1506	C9	22 Mmfd.	Ceramic (2 used)	500V	.33
22-1531	C24	.2 Mfd.		200V	.20
22-1612	C29AB-C29BB	Elect. 40 Mfd.-40 Mfd.		450V	3.50
22-1645	C25	330 Mmfd.	(Molded)	500V	.20
22-1668	C21	200 Mmfd.	Ceramic	500V	.20
22-1676	C7	.001 Mfd.	Ceramic (4 used)	500V	.40
22-1705	C8	30 Mmfd.	Ceramic	500V	.20
22-1761	C31	50 Mmfd.	Ceramic	500V	.20
22-1762	C11	1 Mmfd.	Ceramic	500V	.20
22-1782	C19	.0047 Mfd.	(Molded)	600V	.26
22-1802	C26	.002 Mfd.		1600V	.26
22-1887	C20	25 Mmfd.	Ceramic	500V	.26
22-2104	C1	Three Section Gang			3.80
22-2140	C6	15 Mmfd.	Ceramic	500V	.20
22-2243	C30AB-C30BB	Elect. 20 Mfd.-40 Mfd.		450V	3.00
22-2251	C16	Trimmer Cond.			.35

Resistors

63-966	R12	4700 ohm	2W	20%	Ins.	Res.	.19
63-1452	R26	270 ohm	WW	2W	10%	Ins. Res.	.13
63-1722	R16	33 ohm	1/2W	10%	Ins.	Res.	.21
63-1723	R2	33 ohm	1/2W	20%	Ins.	Res.	.21
63-1737	R4	68 ohm	1/2W	20%	Ins.	Res.	.21
63-1744	R17	100 ohm	1/2W	20%	Ins.	Res.	.21
63-1758	R3	220 ohm	1/2W	20%	Ins.	Res. (3 used)	.21
63-1764	R24	330 ohm	1/2W	10%	Ins.	Res.	.21
63-1771	R8	470 ohm	1/2W	10%	Ins.	Res.	.21
63-1772	R7	470 ohm	1/2W	20%	Ins.	Res.	.21
63-1786	R9	1000 ohm	1/2W	20%	Ins.	Res.	.21
63-1793	R14	1500 ohm	1/2W	20%	Ins.	Res.	.21
63-1799	R32	2200 ohm	1/2W	10%	Ins.	Res.	.21
63-1820	R36	6800 ohm	1/2W	10%	Ins.	Res.	.21
63-1827	R6	10K ohm	1/2W	10%	Ins.	Res. (2 used)	.21
63-1842	R22	22K ohm	1/2W	20%	Ins.	Res. (2 used)	.21
63-1845	R23	27K ohm	1/2W	10%	Ins.	Res.	.21
63-1848	R30	33K ohm	1/2W	10%	Ins.	Res.	.21
63-1855	R13	47K ohm	1/2W	10%	Ins.	Res.	.21
63-1856	R10	47K ohm	1/2W	20%	Ins.	Res.	.21
63-1869	R29	100K ohm	1/2W	10%	Ins.	Res.	.21
63-1870	R21	100K ohm	1/2W	20%	Ins.	Res.	.21
63-1876	R27	150K ohm	1/2W	10%	Ins.	Res. (2 used)	.21
63-1884	R11	220K ohm	1/2W	20%	Ins.	Res. (3 used)	.21
63-1890	R25	330K ohm	1/2W	10%	Ins.	Res. (2 used)	.21
63-1897	R33	470K ohm	1/2W	10%	Ins.	Res.	.21
63-1898	R34	470K ohm	1/2W	20%	Ins.	Res.	.21
63-1912	R1	1 Megohm	1/2W	20%	Ins.	Res.	.21
63-1926	R5	2.2 "	1/2W	20%	Ins.	Res. (3 used)	.21
63-1940	R28	4.7 "	1/2W	20%	Ins.	Res.	.21
63-2091	R18	820 ohm	WW	1/2W	20%	Ins. Res.	.21
63-2138	R37AB-R37BB	Candohm					1.10
63-2139	R31	Volume Control & Switch					1.81
63-2141	R15	22K ohm	2W	20%	Ins.	Res.	.33
63-2142	R35	130 ohm	Zipohm	5W	10%	Ins. Res.	.43

Miscellaneous

11-106	Line Cord & Plug 9 ft. long	.80
19-212	Transformer Mtg. Clip (95-1252)	.04
54-313	Speed Nut (used on S-13800)	.02
78-580	Nine Contact Socket	.22
78-644	Phono Connector Socket	.12
78-755	Octal Tube Socket (3 used)	.18
78-807	Miniature Tube Socket (2 used)	.15
78-854	Miniature Tube Socket (9 contact)	.35
78-869	Miniature Tube Socket	.20
78-870	Miniature Tube Socket (2 used)	.15
78-871	Miniature Tube Socket	.15
78-896	Three Contact Socket	.10
78-897	Two Contact Socket	.10
80-780	Iron Core Tension Spring (3 used)	.05
80-781	Tuner Arm Tension Spring	.06
85-490	Band Switch	3.00
93-965	Rubber Washer (used on S-13800)	.02
93-1039	Gang Mtg. Cup Washer (2 used)	.01
95-1252 T5	Speaker Output Trans.	2.50
95-1253 T6	Power Transformer	12.50
113-43	#6 x 5/16 Hex Hd. Sl. S.T. (used on S-17258)	.03
114-39	#8 x 1/4 Hex Hd. S.T. (2 used on S-17258)	.60C
148-122	Tuner Arm	.20
149-95	Iron Core & Spring (2 used)	.30
S-17257	Speaker Cable & Eyelet Assembly	.35

Radiorgan Esc. Parts Used on H1087R-H1086R

76-444	Radiorgan Knob Shaft (2 used)	.04
114-297	#6 x 1/4 Hex Hd. Sl. S.T. (2 used on S-17252 & S-17253)	.01
S-14255	Radiorgan Mtg. Brkt. Assembly (2 used)	.15
S-17246	Radiorgan Knob & Eyelet Assembly (Treble)	.20
S-17247	Radiorgan Knob & Eyelet Assembly (Voice)	.20
S-17248	Radiorgan Knob & Eyelet Assembly (Alto)	.20
S-17249	Radiorgan Knob & Eyelet Assembly (Bass)	.20
S-17250	Radiorgan Knob & Eyelet Assembly (Lo-Bass)	.20
S-17251	Radiorgan Knob & Eyelet Assembly (Normal)	.20
S-17252	Radiorgan Esc. & Knob Assembly (R.H.)	1.55
S 17253	Radiorgan Esc. & Knob Assembly (L.H.)	1.55

19-79	Plug Cap & Insulator	
22-1745	250 Mmfd. Ceramic 500V	.20
58-195	9 Prong Plug	.20
63-1722 R16	33 ohm 1/2W 10% Ins. Res.	.21
63-1778 R20	680 ohm 1/2W 10% Ins. Res.	.21
63-1813 R19	4700 ohm 1/2W 10% Ins. Res.	.21
63-1862 R38	68K ohm 1/2W 10% Ins. Res.	.21
63-1912 R1	1 Megohm 1/2W 20% Ins. Res.	.21
S-14261	Radiogran Strip & Contact Assembly (2 used)	.15
S-17255	Radiogran Cabel Assembly	2.60

Cabinet Parts H1087R

2-214	Cabinet Back (Phono Section)	1.50
14-1279R	Cabinet for H1087R Console Combination Model	---
16-662	Packing Carton	---
19-9	Cable Clip	.03
19-169	Record Changer Mtg. Clip (2 used)	.07
19-210	Loop Connector Clip (2 used)	.03
46-872	Volume Control Knob	.15
46-876	Tuning Control Knob	.15
46-877	Dummy Knob	.15
46-899	Band Switch Knob	.15
49-693 SP-1	12" PM Speaker ZC12161 Cone & Voice Coil	15.00 4.60
57-1284	Strike Plate (3 used)	.05
57-1481	Escutcheon Clamping Plate (4 used)	.02
57-1666	Radio Dial Escutcheon	4.50
70-3	#5 x 1/2 R.H.W.S. Steel N.P. (1 used 19-9 & 2 used 83-1220)	.85C
70-86	#6 x 5/8 Washer Hd. Wood Screw St. Br. (8 used to Mt. 2-214)	.60C
74-71	Ventilating Screen	.40
78-891	Pilot Light Socket & Wire	.60
80-604	Hinge Spring (2 used)	.15
80-830	Record Changer Mtg. Spring (4 used)	.03
83-1220	Pilot Light Socket Mtg. Strip	.03
90-367	Pilot Light Tube	.01
93-168	Rubber Shoulder Washer (4 used)	.07
100-36 PL1	Pilot Light Bulb	.11
112-808	#6 x 5/16 Phillips Rd. Hd. S.T. (4 used on Esc. Mtg.)	.02
112-809	Record Changer Mtg. Screw (3 used)	.08
114-350	#8 x 7/16 Hex Hd. Sl. S.T. (4 used on Esc. Mtg.)	.02
114-354	Chassis Mtg. Screw (4 used)	.07
156-35	Bullet Catch (3 used)	.05
159-50	Plug Button Black Oxide (2 used)	.01
165-9	Metal Glide (2 used)	.03
165-14	Metal Glide (2 used)	.03
166-55	Tack Bumper (3 used)	.03
171-7	Pilot Light Lens	.20
188-54	Knob Clamping Ring (46-876)	.02
192-138	Dial Glass	.50
202-697	F. M. Instruction Book	.10
202-834	Radio-Phono Instruction Book	.25
S-14029	Variable Speed Record Changer	---
S-15528 L1	Low Impedance Loop Assembly	.35
S-15536	Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15780	Cobra Tone Arm Cartridge	3.50
S-16419	Record Adapter Plug & Envelope Assembly	.60
S-17005	Record Changer Mtg. Fram Assembly	3.00
S-17167	Volume Control Knob Assembly	.25
S-17255	Radiogran Cable Assembly	2.60
S-17328 L2	Loop Loading Coil Assembly	.65

Cabinet Parts H1086R

Model H1086R is the same as H1087R except the following:

2-192	Cabinet Back (Phono Section)	1.50
14-1251R	Cabinet for H1086R Console Combination Model	---
16-641	Packing Carton	---

Cabinet Parts H1083E

2-215	Cabinet Back (Phono Section)	1.50
14-1280E	Cabinet for H1083E Console Combination	---
16-666	Packing Carton	---
19-9	Cable Clip	.03
19-169	Record Changer Mtg. Clip (2 used)	.07
19-210	Loop Connector Clip (2 used)	.03
46-876	Tuning Control Knob	.15
46-899	Band Switch Knob	.15
49-693	12" P.M. Speaker ZC12161 Cone & Voice Coil	15.00 4.60
57-1270	Strike Plate (2 used)	.05
57-1481	Esc. Clamping Plate (4 used)	.02
57-1666	Radio Dial Esc.	4.50
70-3	#5 x 1/2 R.H.W.S. Steel N.P. (1 used on 19-9 & 2 used 83-1220)	.85C
70-86	#6 x 5/8 Washer Hd. Wood Screw St. Br. (8 used to mt. Z-215)	.60C
74-71	Ventilating Screen	.40
78-891	Pilot Light Socket & Wire	.60
80-604	Hinge Spring (2 used)	.15
80-830	Record Changer Mtg. Spring (4 used)	.03
83-1220	Pilot Light Socket Mtg. Strip	.03
90-367	Pilot Light Tube	.01
93-168	Rubber Shoulder Washer (4 used on Chassis)	.07
100-36	Pilot Light Bulb	.11
112-808	#6 x 5/16 Phill. Rd. Hd. S.T. (4 used esc. mtg.)	.02
112-809	Record Changer Mtg. Screw (3 used)	.08
114-350	#8 x 7/16 Hex Hd. Sl. S.T. (4 used esc. mtg.)	.02
114-354	Chassis Mtg. Screw (4 used)	.07
156-33	Bullet Catch (2 used)	.05
159-50	Plug Button (2 used)	.01
165-9	Metal Glide (2 used)	.03
165-14	Metal Glide (2 used)	.03
171-7	Pilot Light Lens	.20
188-54	Knob Clamping Ring (46-876)	.02
192-138	Dial Glass	.50
202-697	F.M. Instruction Book	.10
202-834	Radio-Phono Instruction Book	.25
S-14029	Variable Speed Record Changer	---
S-15528	Low Impedance Loop Assembly	.35
S-15536	Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15780	Cobra Tone Arm Cartridge	3.50
S-16419	Record Adapter Plug & Envelope Assembly	.60
S-17005	Record Changer Mtg. Frame Assembly	3.00
S-17167	Volume Control Knob Assembly	.25
S-17255	Radiorgan Cable Assembly (Complete)	2.60
S-17328	Loop Loading Coil Assembly	.65

Radiorgan Esc. Parts Used on H1083E

76-444	Radiorgan Knob Shaft (2 used)	.04
114-297	#6 x 1/4 Hex Hd. Sl. S. T. (2 used on S-17252 & S-17253)	.01
S-14255	Radiorgan Mtg. Brkt. Assembly (2 used)	.15
S-17246	Radiorgan Knob & Eyelet Assembly (Treble)	.20
S-17247	Radiorgan Knob & Eyelet Assembly (Voice)	.20
S-17248	Radiorgan Knob & Eyelet Assembly (Alto)	.20
S-17249	Radiorgan Knob & Eyelet Assembly (Bass)	.20
S-17250	Radiorgan Knob & Eyelet Assembly (Lo-Bass)	.20
S-17251	Radiorgan Knob & Eyelet Assembly (Normal)	.20
S-17252	Radiorgan Esc. & Knob Assembly (R.H.)	1.55
S 17253	Radiorgan Esc. & Knob Assembly (L.H.)	1.55

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	Adj. Pri. and Sec. T1B, T2B, T3B	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 6 AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Primary of Discriminator T4	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 6 AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Secondary of Discriminator T4	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6 BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T3A	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6 BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T2A	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T1A	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

In the event the receiver oscillates during phono operation, adjust C16 4-80 mmf. capacitor to a point at which the oscillation ceases.

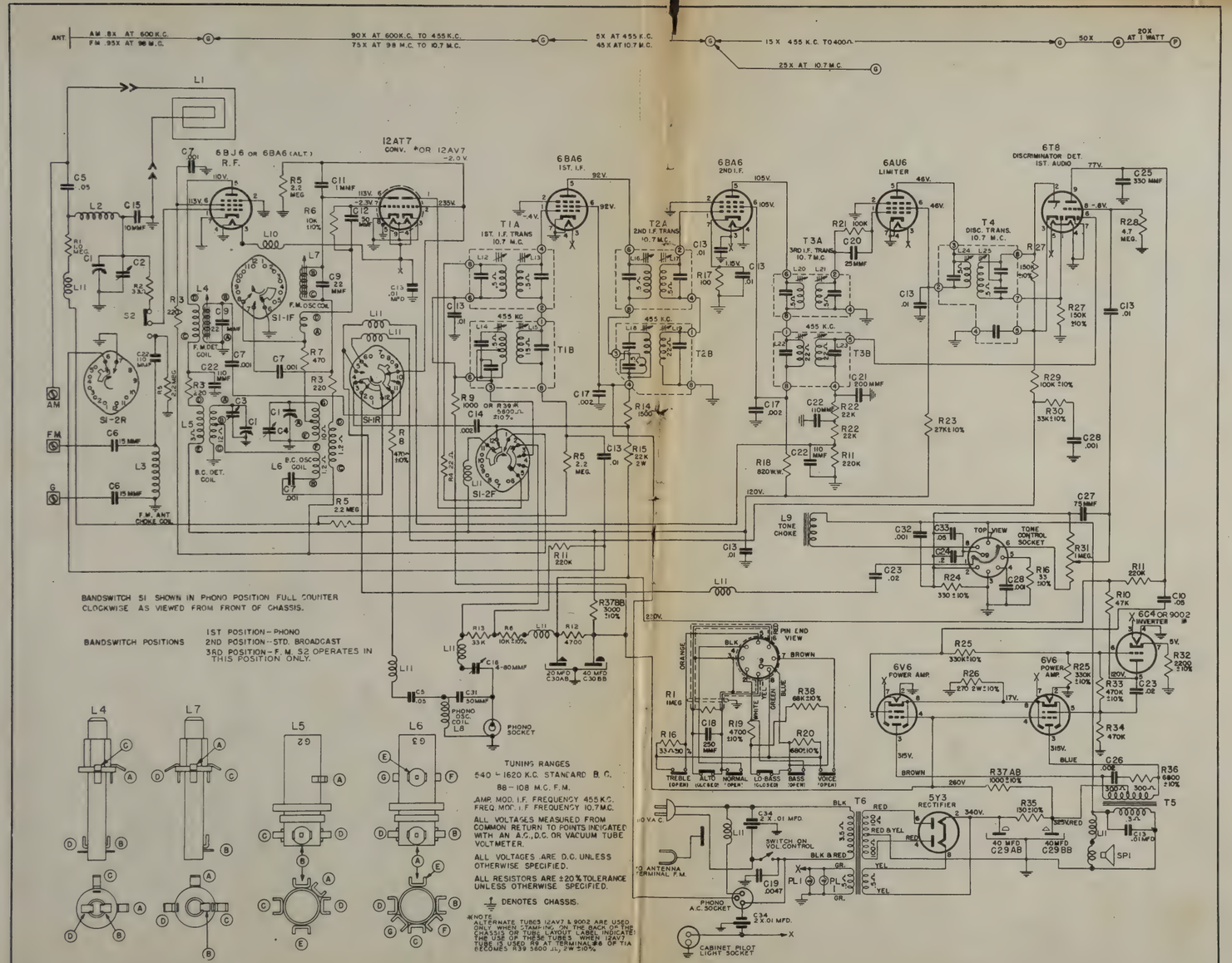
This position of no oscillation will sometimes vary with different cartridges, and in this case readjustment of C16 must be made.

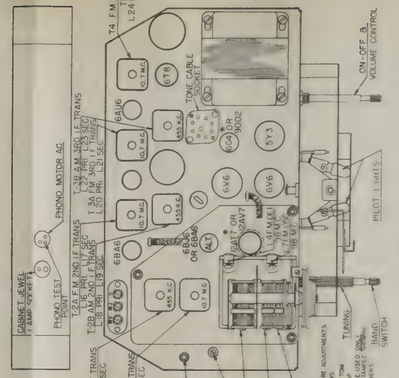
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (Half discriminator load).

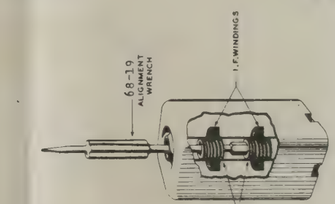
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (Full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

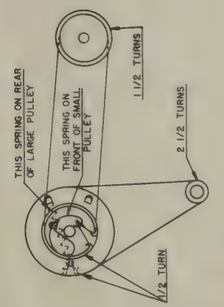
(d) Loosen Slugs by applying a hot iron to the cement.


ANT
AM 8X AT 600K.C.
FM 95X AT 98 M.C.
90X AT 600K.C. TO 455K.C.
73X AT 98 M.C. TO 10.7 M.C.
5X AT 455 K.C.
45X AT 10.7 M.C.
15X 455 K.C. TO 400K
25X AT 10.7 M.C.
50X
20X AT 1 WATT
12AT7 CONV. *OR 12AV7
6BJ6 OR 6BA6 (ALT.) R.F.
6BA6 1ST. I.F.
6BA6 2ND I.F.
6AU6 LIMITER
6T8 DISCRIMINATOR DET. 1ST. AUDIO
T1A 1ST. I.F. TRANS 10.7 M.C.
T1B
T2A 2ND I.F. TRANS. 10.7 M.C.
T2B
T3A 3RD I.F. TRANS. 10.7 M.C.
T3B
T4 DISC. TRANS. 10.7 M.C.
S1-IF
S1-2R
S1-2F
S1-1R
F.M. OSC COIL
F.M. DET. COIL
B.C. OSC COIL
B.C. DET. COIL
F.M. ANT. DIPOLE COIL
L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 L11
R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21 R22 R23 R24 R25 R26 R27 R28 R29 R30 R31 R32 R33 R34 R35 R36 R37AB R38B
C1 C2 C3 C4 C5 C6 C7 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26 C27 C28 C29AB C29BB C30AB C30BB C31 C32 C33 C34
AM
FM
G
BANDSWITCH S1 SHOWN IN PHONO POSITION FULL COUNTER CLOCKWISE AS VIEWED FROM FRONT OF CHASSIS.
BANDSWITCH POSITIONS
1ST POSITION - PHONO
2ND POSITION - STD. BROADCAST
3RD POSITION - F.M. S2 OPERATES IN THIS POSITION ONLY.
PHONO SOCKET
PHONO A.C. SOCKET
TONE CONTROL SOCKET
TOP VIEW
7 PIN END VIEW
6V6 POWER AMP.
6C4 OR 9002 INVERTER
5Y3 RECTIFIER
TREBLE ALTO (CLOSED) (OPEN)
NORMAL (OPEN)
LO-BASS (CLOSED)
BASS (OPEN)
VOICE (OPEN)
TUNING RANGES
540 - 1620 K.C. STANDARD B.C.
88 - 108 M.C. F.M.
AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7 M.C.
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS.
*NOTE ALTERNATE TUBES 12AV7 & 9002 ARE USED ONLY WHEN STAMPING ON THE BACK OF THE CHASSIS OR TUBE LAYOUT LABEL INDICATE THE USE OF THESE TUBES. WHEN 12AV7 TUBE IS USED R39 3600 Ω, 2W ±10% TO TIA BECOMES R39 3600 Ω, 2W ±10%
ANTENNA TERMINAL F.M.
CABINET PILOT LIGHT SOCKET
L4
L7
L5
L6


PHONO MOTOR AC
PHONO TEST
CABINET JEWEL & AMP. OFF-SET
T2A FM 2ND I.F. TRANS L24 SEC. L24 PRI. L25 SEC.
T2B AM 2ND I.F. TRANS L18 SEC. L19 PRI. L20 SEC.
T3A FM 3RD I.F. TRANS L20 SEC. L21 PRI. L24 SEC.
T3B AM 3RD I.F. TRANS L16 SEC. L17 PRI. L18 SEC.
T4 FM DISCRIMINATOR TRANS L24 SEC. L24 PRI. L25 SEC.
T1B 1ST AM I.F. TRANS L14 PRI. L15 SEC.
T1A FM 1ST I.F. TRANS L12 PRI. L13 SEC.
PHONO OSC. TRIMMER
C2 BC ANT 600 K.C.
C3 OSC 1400 K.C.
C4 BC OSC 1600 K.C.
TONE CABLE SOCKET
ON-OFF & VOLUME CONTROL
PILOT LIGHTS
TUNING
BAND SWITCH
6BA6
6AU6
6T8
6C4 OR 9002
5Y3
6V6
NOTE: ALL I.F. TRANSFORMER CORE ADJUSTMENTS ARE MADE FROM THE TOP.
PRIMARY ADJ. POSITION
SECONDARY ADJ. POSITION
* (12AV7 OR 9002 CAN BE USED ONLY WHEN STAMPED ON BACK OF CHASSIS THIS APPLIES TO THE NEXT THREE NUMBERS)



Detail of IF Transformer



DIAL CORD DRIVE

TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 10H20Z chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on all Bands.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM Alignment: The AM and FM IF transformers in this reciever are of the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

	Speaker Cable & Eyelet Assem.	.35

Radiorgan Esc. Parts Used on H1087R-H1086R

76-444	Radiorgan Knob Shaft (2 used)	.04
114-297	#6 x 1/4 Hex Hd. Sl. S.T. (2 used on S-17252 & S-17253)	.01
S-14255	Radiorgan Mtg. Brkt. Assembly (2 used)	.15
S-17246	Radiorgan Knob & Eyelet Assembly (Treble)	.20
S-17247	Radiorgan Knob & Eyelet Assembly (Voice)	.20
S-17248	Radiorgan Knob & Eyelet Assembly (Alto)	.20
S-17249	Radiorgan Knob & Eyelet Assembly (Bass)	.20
S-17250	Radiorgan Knob & Eyelet Assembly (Lo-Bass)	.20
S-17251	Radiorgan Knob & Eyelet Assembly (Normal)	.20
S-17252	Radiorgan Esc. & Knob Assembly (R.H.)	1.55
S-17253	Radiorgan Esc. & Knob Assembly (L.H.)	1.55

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 or 12AV7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	Adj. Pri. and Sec. T1B, T2B, T3B	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 6 AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Primary of Discriminator T4	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 6 AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Secondary of Discriminator T4	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6 BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T3A	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BJ6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T2A	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 or 12AV7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T1A	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

NOTE: If 12AT7 is replaced by a 12AV7 or vice versa the RF portion of this receiver must be realigned.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000-000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

In the event the receiver oscillates during phono operation, adjust C16 4-80 mmf. capacitor to a point at which the oscillation ceases.

This position of no oscillation will sometimes vary with different cartridges, and in this case readjustment of C16 must be made.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (Half discriminator load).
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (Full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.

S14009 Dual Speed Intermixer Record Changer (Used on 9H881LP-9H885LP-9H888LP)

S14009 Dual Speed Intermixer Record Changer is the same as S14002 Intermixer Record Changer except it has a 2-speed motor assembly and a green Cobra tone arm.

Part No.	Description	Price
OMIT:		
S-11118	Idler Wheel Assembly	
S-11657	Idler Wheel Stud & Washer Assy.	
S-13466	Cobra Tone Arm Assembly	
43-147	Record Ejector Housing	
54-66	#10-32x5/16" Hex. Nut Steel N.P.	
80-368	Idler Wheel Spring	
93-673	Idler Wheel Stud Washer-Small	
93-677	Idler Wheel Stud Fishpaper Washer Large	
93-678	Idler Wheel Stud Fishpaper Washer Small	
93-679	IdlerWheel Stud Felt Washer	
93-900	Motor Mounting Washer (Fibre) (3 used)	
93-903	Motor Mounting Washer (Steel) (3 used)	
125-61	Rubber Grommet (3 used)	
141-109	A.C. Motor	
188-32	Retaining Ring	
ADD:		
S-15224	Cobra Tone Arm Assembly (Compl.) consisting of:	
	S-15222 - Cartridge Assy. (Compl.) (Green)	3.50
	S-15226 Tone Arm Hinge Plate & Brkt. Assy.	.75
	S-15228 Hinge Plate Final Assy.	1.25
	56-144 Socket Retaining Pin	.05
	78-561 Cartridge Socket	.15
	80-605 Socket Tension Spring	.10
	83-1121 Felt Strip	.01
	112-619 #2x5/16" R.H. Self Tapping Screw Cad. Pl. (3 used)	.02
	135-13 Counterweight	.30
	148-106 Plastic Tone Arm Only	.75
S-15235	Motor & Lever Assy. (S-15230)	12.50
S-15313	Cobra Tone Arm Assy. (Complete) Consisting of:	
	S-11473 Cobra Tone Arm Cartridge Assembly	3.50
	S-13046 Swivel Brkt. & Bushing & Pin Assembly	.60
	S-13060 Hinge Plate Spring & Swivel Brkt. Assy.	1.00
	S-13061 Socket, Hinge Plate & Stop Assembly	1.50
	S-15311 Shielded Lead Assy.	.40
	S-15312 Hinge Plate Assy. (Complete)	1.75
	56-144 Pin (Socket Retaining)	.05
	56-199 Weight	.01
	78-561 Socket	.15
	80-605 Socket Tension Spring	.10
	83-1121 Felt Stop	.01
	112-619 #2x5/16" R.H. Self Tapping Screw Cad. Pl. (3 used)	.02
	148-83 Tone Arm Housing-Only	.75
27-111	Spacer Disk	.01
32-26	Dual Speed Belt	.20
43-171	Tone Arm Support Housing	.25
43-173	Record Ejector Housing	1.75
56-260	Groove Pin - 3/32" dia. x 3/4" lg. Cad. Pl.	.02
57-1452	Speed Indicator Plate	.35
57-1454	Switch Lever Retainer Plate	.01
57-1459	Switch Plate	.10
61-125	Idler Wheel	.75
84-68	Tone Arm Rest	.08
85-372	Three Position Switch	.34
94-654	Motor Mtg. Bushing	.07
112-581	#6x3/8" RH. Self Tapping Screw (2 used on 43-171)	.75C
112-637	#4-40x1/4" B.H.M.S. Steel N.P. (2 used on 85-372)	.01
114-248	#6x5/16" Hex. Hd. Slotted Self Tapping Screw Cad. (used on 84-68)	.01
117-162	Switch Lever	.04
125-12	Rubber Grommet	.04
125-45	Rubber Grommet	.03
125-71	Motor Mtg. Grommet (3 used)	.04

S14010 Dual Speed Intermixer Record Changer (Used on 12H990LP-991E-LP-992R-LP-993R-LP 994R-LP-994GO-LP)

S14010 Dual Speed Intermixer Record Changer is the same as S14006 Record Changer except it has a 2-speed motor assembly and a green Cobra tone arm.

OMIT:		
S-11118	Idler Wheel Assembly	
S-11657	Idler Wheel Stud & Washer Assy.	
S-13063	Cobra Tone Arm Assy.	
43-164	Record Ejector Housing	
54-66	#10-32x5/16" Hex. Nut	
80-368	Idler Wheel Tension Spring	
93-673	Idler Wheel Stud Washer-Small	

PARTS LIST

Dial Assembly

Part No.	Diag. No.	Description	Price
78-898		Dial Light Socket & Wire	.35
80-69		Dial Cord Spring	.05
80-746		Pulley Retaining Spring	.02
80-747		Dial Cord Spring	.10
100-67	PL-1	Dial Light Bulb	.11
188-30		Retaining Ring (used on S-17155)	.02
S-17155		Tuning Shaft & Pulley Assem.	.35
S-17157		Pointer & Pulley Assem.	.55
S-17158		Dial Cord & Eyelet Assem. (Long)	.07
S-17159		Dial Cord & Eyelet Assem. (Short)	.06
S-17258		Dial Scale & Brkt. Assem.	1.50
S-17261		Brkt. & Pulley Bushing Assem.	.30

Coils and Chokes

20-337		R. F. Choke Coil (10 used)	.20
95-1150	T3A	2nd & 3rd I.F. Trans. (F.M.)	1.50
95-1153	T4	Discriminator Trans.	1.50
95-1201	T1A	1st. I.F. Trans. (F.M.)	1.50
95-1248	T1B	1st. I.F. Trans. (B.C.)	1.60
95-1249	T2B	2nd. I.F. Trans. (B.C.)	1.60
95-1254	T3B	3rd. I.F. Trans. (B.C.)	1.60
S-12603	L8	Phono Oscillator Coil Assem.	.75
S-13800	L9	Tone Choke Assem.	.60
S-13997	L10	Filament Choke Coil Assem.	.40
S-15691	L7	F.M. Osc. Coil Assem.	.40
S-15743	L4	F.M. Det. Coil Assem.	.65
S-16344	L5	Broadcast Det. Coil Assem.	.60
S-16345	L6	Broadcast Osc. Coil Assem.	.60
S-16408	L3	Ant. Choke Coil Assem.	.25

Condensers

22-3	C13	.01 Mfd. Ceramic (9 used)	500V	.26
22-5	C22	110 Mmfd. Ceramic (or 22-1669)(4 used)	500V	.26
22-171	C10	.05 Mfd.	600V	.33
22-178	C33	.05 Mfd.	200V	.20
22-348	C32	.001 Mfd. (Molded)	500V	.26
22-492	C14	.002 Mfd.	600V	.20
22-829	C5	.05 Mfd. (2 used)	200V	.20
22-830	C23	.02 Mfd. (2 used)	600V	.20
22-1203	C28	.001 Mfd. (2 used)	600V	.20
22-1220	C17	.002 Mfd. (2 used)	600V	.20
22-1256	C27	75 Mmfd. (Molded)	500V	.20
22-1367	C12	50 Mmfd. Ceramic	500V	.33
22-1506	C9	22 Mmfd. Ceramic (2 used)	500V	.33
22-1531	C24	.2 Mfd.	200V	.20
22-1612	C29AB-C29BB	Elct. 40 Mfd. 40 Mfd.	450V	3.50
22-1645	C25	330 Mmfd. (Molded)	500V	.20
22-1668	C21	200 Mmfd. Ceramic	500V	.20
22-1676	C7	.001 Mfd. Ceramic (4 used)	500V	.40
22-1761	C31	50 Mmfd. Ceramic	500V	.20
22-1762	C11	1 Mmfd. Ceramic	500V	.20
22-1782	C19	.0047 Mfd. (Molded)	600V	.26
22-1802	C26	.002 Mfd.	1600V	.26
22-1863	C15	10 Mmfd. Ceramic	500V	.25
22-1887	C20	25 Mmfd. Ceramic	500V	.26
22-2104	C1	Three Section Variable		3.80
22-2140	C6	15 Mmfd. Ceramic (2 used)	500V	.20
22-2243	C30AB-C30BB	Elect. 20 Mfd.-350V x 40 Mfd.	450V	3.00
22-2251	C16	Trimer Cond.		.35
22-2276	C34	Dual Ceramic .01 Mfd.-.01 Mfd.	500V	.50

Resistors

63-966	R12	4700 ohm 2w 20%	Carb. Res.		.19
63-1193		5600 ohm 2w 10%	Ins. Res.		.36
		(used only when 12AV7 is used or 63-2064)			
63-1452	R26	270 ohm w.w. 2w 10%	Ins. Res.		.33
63-1716		22 ohm 1/2w 20%	Ins. Res.		.21
		(or 63-2446 if req.)			.02
63-1722	R16	33 ohm 1/2w 10%	Ins. Res.		.21
63-1723	R2	33 ohm 1/2w 20%	Ins. Res.		.21
63-1744	R17	100 ohm 1/2w 20%	Ins. Res.		.21
63-1758	R3	220 ohm 1/2w 20% (3 used)	Ins. Res.		.21
63-1764	R24	330 ohm 1/2w 10%	Ins. Res.		.21
63-1771	R8	470 ohm 1/2w 10%	Ins. Res.		.21
63-1772	R7	470 ohm 1/2w 20%	Ins. Res.		.21
63-1786	R9	1000 ohm 1/2w 20%	Ins. Res.		.21
		(used only when 12AT7 is used)			
63-1793	R14	1500 ohm 1/2w 20%	Ins. Res.		.21
63-1799	R32	2200 ohm 1/2w 10%	Ins. Res.		.21
63-1820	R36	6800 ohm 1/2w 10%	Ins. Res.		.21
63-1827	R6	10K ohm 1/2w 10% (2 used)	Ins. Res.		.21
63-1842	R22	22K ohm 1/2w 20% (2 used)	Ins. Res.		.21
63-1845	R23	27K ohm 1/2w 10%	Ins. Res.		.21
63-1848	R30	33K ohm 1/2w 10%	Ins. Res.		.21
63-1849		33K ohm 1/2w 20%	Ins. Res.		.21
63-1856	R10	47K ohm 1/2w 20%	Ins. Res.		.21
63-1869	R29	100K ohm 1/2w 10%	Ins. Res.		.21
63-1870	R21	100K ohm 1/2w 20%	Ins. Res.		.21
63-1876	R27	150K ohm 1/2w 10% (2 used)	Ins. Res.		.21
63-1884	R11	220K ohm 1/2w 20% (3 used)	Ins. Res.		.21
63-1890	R25	330K ohm 1/2w 10% (2 used)	Ins. Res.		.21
63-1897	R33	470K ohm 1/2w 10%	Ins. Res.		.21
63-1898	R34	470K ohm 1/2w 20%	Ins. Res.		.21
63-1912	R1	1 Megohm 1/2w 20%	Ins. Res.		.21
63-1926	R5	2.2 Megohm 1/2w 20% (4 used)	Ins. Res.		.21
63-1940	R28	4.7 Megohm 1/2w 20%	Ins. Res.		.21
63-2091	R18	820 ohm ww 1/2w 20%	Ins. Res.		.21
63-2138	R37AB-R37BB	Candohm			1.10
63-2139	R31	Volume Control & Switch			1.81
63-2141	R15	22K ohm 2w 20%	Ins. Res.		.33
63-2142	R35	130 ohm 5w 10% Zipohm			.43

Miscellaneous

11-85		Line Cord & Plug (6 ft. lg.)	.65
19-212		Trans. Mtg. Clip (2 used on 95-1252)	.04
54-306		Speed Nut (used on S-13800)	.06
57-1736		Chassis Bottom Plate	.60
78-580		Nine Contact Socket	.22
78-644		Phono Connector Socket	.12
78-755		Octal Tube Socket (3 used)	.18
78-807		Miniature Tube Socket	.15
78-869		Miniature Tube Socket	.20
78-870		Miniature Tube Socket (3 used)	.15
78-871		Miniature Tube Socket	.15
78-896		Three Contact Socket	.10
78-897		Two Contact Socket	.10
78-903		Miniature Tube Socket (9 contact)	.30
80-780		Iron Core Tension Spring (3 used)	.05
80-781		Tuner Arm Tension Spring	.06
80-865		Ground Spring	.05
80-868		Grounding Spring	.15
85-505	S2	S.P.D.T. Switch (ant)	.90
85-508	S1	Band Switch	3.25
93-965		Rubber Washer (used on S-13800)	.02
93-1039		Gang. Cond. Mtg. Cup Washer (2 used)	.01
95-1252	T5	Speaker Output Trans.	2.50
95-1253	T6	Power Trans.	12.50
113-43		6-32x5/16 Hex Hd. S. T. (used on S-17258)	.03
114-39		8-32x1/4" lgx 1/4" Hex Hd. (2 used on S-17258 & 4 used on 57-1736	.60
126-618		Miniature Tube Shield	.02
148-122		Tuner Arm	.20
149-95		Iron Core & Spring (2 used)	.30
S-17257		Speaker Cable & Eyelet Assem.	.35

Radiorgan Esc. Parts Used on H1087R-H1086R

76-444		Radiorgan Knob Shaft (2 used)	.04
114-297		#6 x 1/4 Hex Hd. Sl. S.T. (2 used on S-17252 & S-17253)	.01
S-14255		Radiorgan Mtg. Brkt. Assembly (2 used)	.15
S-17246		Radiorgan Knob & Eyelet Assembly (Treble)	.20
S-17247		Radiorgan Knob & Eyelet Assembly (Voice)	.20
S-17248		Radiorgan Knob & Eyelet Assembly (Alto)	.20
S-17249		Radiorgan Knob & Eyelet Assembly (Bass)	.20
S-17250		Radiorgan Knob & Eyelet Assembly (Lo-Bass)	.20
S-17251		Radiorgan Knob & Eyelet Assembly (Normal)	.20
S-17252		Radiorgan Esc. & Knob Assembly (R.H.)	1.55
S-17253		Radiorgan Esc. & Knob Assembly (L.H.)	1.55

S-17255 Radiorgan Cable Assembly

15-79		Plug Cap & Insulator	.09
22-1745		250 Mmfd. Ceramic 500V	.20
58-195		9 Prong Plug	.20
63-1722	R16	33 ohm 1/2W 10% Ins. Res.	.21
63-1778	R20	680 ohm 1/2W 10% Ins. Res.	.21
63-1813	R19	4700 ohm 1/2W 10% Ins. Res.	.21
63-1862	R38	68K ohm 1/2W 10% Ins. Res.	.21
63-1912	R1	1 Megohm 1/2W 20% Ins. Res.	.21
S-14261		Radiorgan Strip & Contact Assembly (2 used)	.15
S-17255		Radiorgan Cable Assembly	2.60

Cabinet Parts H1087R

2-214		Cabinet Back (Phono Section)	1.50
14-1279R		Cabinet for H1087R Console Combination Model	
16-662		Packing Carton	
19-9		Cable Clip	.03
19-169		Record Changer Mtg. Clip (2 used)	.07
19-210		Loop Connector Clip (2 Used)	.03
46-872		Volume Control Knob	.15
46-876		Tuning Control Knob	.15
46-877		Dummy Knob	.15
46-899		Band Switch Knob	.15
49-693	SP-1	12" PM Speaker ZC12161 Cone & Voice Coil	15.00 4.60
57-1284		Strike Plate (3 used)	.05
57-1481		Escutcheon Clamping Plate (4 used)	.02
57-1666		Radio Dial Escutcheon	4.50
70-3		#5 x 1/2 R.H.W.S. Steel N.P. (1 used 19-9 & 2 used 83-1220)	.85C
70-86		#6 x 5/8 Washer Hd. Wood Screw St. Br. (8 used to Mt. 2-214)	.60C
78-891		Pilot Light Socket & Wire	.60
80-604		Hinge Spring (2 used)	.15
80-830		Record Changer Mtg. Spring (4 used)	.03
83-1220		Pilot Light Socket Mtg. Strip	.03
90-367		Pilot Light Tube	.01
93-168		Rubber Shoulder Washer (4 used)	.07
100-36	PL1	Pilot Light Bulb	.11
112-808		#6 x 5/16 Phillips Rd. Hd. S.T. (4 used on Esc. Mtg.)	.02
112-809		Record Changer Mtg. Screw (3 used)	.08
114-350		#8 x 7/16 Hex Hd. Sl S.T. (4 used on Esc. Mtg.)	.02
114-354		Chassis Mtg. Screw (4 used)	.07
156-35		Bullet Catch (3 used)	.05
159-50		Plug Button Black Oxide (2 used)	.01
165-9		Metal Glide (2 used)	.03
165-14		Metal Glide (2 used)	.03
166-55		Tack Bumper (3 used)	.03
171-7		Pilot Light Lens	.20
188-54		Knob Clamping Ring (46-876)	.02
192-138		Dial Glass	.50
202-697		F. M. Instruction Book	.10
202-882		Radio-Phono Instruction Book	.25
S-14029		Variable Speed Record Changer	
S-15528	L1	Low Impedance Loop Assembly	.35
S-15536		Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15780		Cobra Tone Arm Cartridge	3.50
S-16419		Record Adapter Plug & Envelope Assembly	.60
S-17005		Record Changer Mtg. Fram Assembly	3.00
S-17167		Volume Control Knob Assembly	.25
S-17255		Radiorgan Cable Assembly	2.60
S-17328	L2	Loop Loading Coil Assembly	.65

Cabinet Parts H1086R

Model H1086R is the same as H1087R except the following:

2-192		Cabinet Back (Phono Section)	1.50
14-1251R		Cabinet for H1086R Console Combination Model	
16-641		Packing Carton	

Cabinet Parts H1083E

2-215		Cabinet Back (Phono Section)	1.50
14-1280E		Cabinet for H1083E Console Combination	
16-666		Packing Carton	
19-9		Cable Clip	.03
19-169		Record Changer Mtg. Clip (2 used)	.07
19-210		Loop Connector Clip (2 used)	.03
46-876		Tunning Control Knob	.15
46-899		Band Switch Knob	.15
49-693		12" P.M. Speaker ZC12161 Cone & Voice Coil	15.00 4.60
57-1270		Strike Plate (2 used)	.05
57-1481		Esc. Clamping Plate (4 used)	.02
57-1666		Radio Dial Esc.	4.50
70-3		#5 x 1/2 R.H.W.S. Steel N.P. (1 used on 19-9 & 2 used 83-1220)	.85C
70-86		#6 x 5/8 Washer Hd. Wood Screw St. Br. (8 used to mt. 2-215)	.60C
78-891		Pilot Light Socket & Wire	.60
80-604		Hinge Spring (2 used)	.15
80-830		Record Changer Mtg. Spring (4 used)	.03
83-1220		Pilot Light Socket Mtg. Strip	.03
90-367		Pilot Light Tube	.01
93-168		Rubber Shoulder Washer (4 used on Chassis)	.07
100-36		Pilot Light Bulb	.11
112-808		#6 x 5/16 Phill. Rd. Hd. S.T. (4 used esc. mtg.)	.02
112-809		Record Changer Mtg. Screw (3 used)	.08
114-350		#8 x 7/16 Hex Hd. Sl S.T. (4 used esc. mtg.)	.02
114-354		Chassis Mtg. Screw (4 used)	.07
156-33		Bullet Catch (2 used)	.05
159-50		Plug Button (2 used)	.01
165-9		Metal Glide (2 used)	.03
165-14		Metal Glide (2 used)	.03
171-7		Pilot Light Lens	.20
188-54		Knob Clamping Ring (46-876)	.02
192-138		Dial Glass	.50
202-697		F.M. Instruction Book	.10
202-882		Radio-Phono Instruction Book	.25
S-14029		Variable Speed Record Changer	
S-15528		Low Impedance Loop Assembly	.35
S-15536		Record Changer Compt. Hinge Brkt. & Link Assembly (2 used)	.50
S-15780		Cobra Tone Arm Cartridge	3.50
S-16419		Record Adapter Plug & Envelope Assembly	.60
S-17005		Record Changer Mtg. Frame Assembly	3.00
S-17167		Volume Control Knob Assembly	.25
S-17255		Radiorgan Cable Assembly (Complete)	2.60
S-17328		Loop Loading Coil Assembly	.65

Radiorgan Esc. Parts Used on H1083E

76-444		Radiorgan Knob Shaft (2 used)	.04
114-297		#6 x 1/4 Hex Hd. Sl S.T. (2 used on S-17252 & S-17253)	.01
S-14255		Radiorgan Mtg. Brkt. Assembly (2 used)	.15
S-17246		Radiorgan Knob & Eyelet Assembly (Treble)	.20
S-17247		Radiorgan Knob & Eyelet Assembly (Voice)	.20
S-17248		Radiorgan Knob & Eyelet Assembly (Alto)	.20
S-17249		Radiorgan Knob & Eyelet Assembly (Bass)	.20
S-17250		Radiorgan Knob & Eyelet Assembly (Lo-Bass)	.20
S-17251		Radiorgan Knob & Eyelet Assembly (Normal)	.20
S-17252		Radiorgan Esc. & Knob Assembly (R.H.)	1.55
S-17253		Radiorgan Esc. & Knob Assembly (L.H.)	1.55

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 or 12AV7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	Adj. Pri. and Sec. T1B, T2B, T3B	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 6 AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Primary of Discriminator T4	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 6 AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Secondary of Discriminator T4	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6 BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T3A	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BJ6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T2A	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 or 12AV7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		Adj. Pri. and Sec. T1A	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

NOTE: If 12AT7 is replaced by a 12AV7 or vice versa the RF portion of this receiver must be realigned.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000-000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

In the event the receiver oscillates during phono operation, adjust C16 4-30 mmf. capacitor to a point at which the oscillation ceases.

This position of no oscillation will sometimes vary with different cartridges, and in this case readjustment of C16 must be made.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (Half discriminator load).
(b) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (Full discriminator load).
(c) Vacuum Tube Voltmeter from limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.

Part No.	Description	Price
93-677	Idler Wheel Fishpaper Washer-Large	
93-678	Idler Wheel Fishpaper Washer-Small	
93-679	Idler Wheel Stud Felt Washer	
93-900	Motor Mounting Washer (Fibre) (3 used)	
93-903	Motor Mounting Washer (Steel) (3 used)	
125-61	Rubber Grommet (3 used)	
141-108	Phono Motor	
159-50	Cinch Plug Button	
188-32	Retaining Ring (4 used)	

ADD:

S-15224	Cobra Tone Arm Assy. (Complete) Consisting of:		
	S-15222	Cartridge Assy. Complete (Green)	3.50
	S-15226	Tone Arm Hinge Plate & Brkt. Assembly	.75
	S-15228	Hinge Plate Final Assy.	1.25
	56-144	Socket Retaining Pin	.05
	78-561	Cartridge Socket	.15
	80-605	Socket Tension Spring	.10
	83-1121	Felt Strip	.01
	112-619	#2x5/16" R.H. Self Tapping Screw Cad. Pl. (3 used)	.02
	135-13	Counterweight	.30
	148-106	Plastic Tone Arm-Only	.75
S-15238	Motor & Lever Assembly		12.50
S-15338	Cobra Tone Arm Assy. (Complete) Consisting of:		
	S-11473	Cobra Tone Arm Cartridge Assembly	3.50
	S-13046	Swivel Brkt. & Bushing Assembly	.60
	S-13060	Hinge Plate Spring & Swivel Brkt. Assy.	1.00
	S-13061	Socket Hinge Plate & Stop Assembly	1.50
	S-15311	Shielded Lead Assy.	.40
	S-15312	Hinge Plate Assy. (Compl)	1.75
	56-144	Pin (Socket Retaining)	.05
	56-199	Weight	.01
	78-561	Socket	.15
	80-605	Socket Tension Spring	.10
	83-1121	Felt Stop	.01
	112-619	#2x5/16" R.H. Self Tapping Screw Cad. Pl. (3 used)	.02
	148-51	Tone Arm Housing-Only	.75
27-111	Spacer Disk		.01
32-26	Dual Speed Belt		.20
43-172	Tone Arm Support Housing		.25
43-174	Record Ejector Housing		1.75

Part No.	Description	Price
56-260	Groove Pin - 3/32" dia. x3/4" lg. Cad. Pl.	.02
57-1452	Speed Indicator Plate	.35
57-1454	Switch Lever Retainer Plate	.01
57-1459	Switch Plate	.10
84-65	Tone Arm Rest	.08
85-372	Three Position Switch	.34
94-654	Motor Mtg. Bushing (3 used)	.07
112-581	#6x3/8" R.H. Self Tapping Screw	.75C
112-637	#4-40x1/4" B.H.M.S. Steel N.P.	.01
114-248	#6x5/16" Hex. Hd. Slotted Self Tapping Screw	.01
117-162	Switch Lever	.04
125-12	Rubber Grommet	.04
125-45	Rubber Grommet	.03
125-71	Motor Mtg. Grommets (3 used)	.04

S14011 Dual Speed Intermixer Record Changer (Used on 14H989R-LP)

S14011 Dual Speed Intermixer Record Changer is the same as S13675 Intermixer Record Changer except it has a 2-speed motor assembly and a green Cobra tone arm.

OMIT:

S-11118	Idler Wheel Assembly
S-11657	Idler Wheel Stud & WasherAssy.
S-13466	Cobra Tone Arm Assembly
43-147	Record Ejector Housing
54-66	#10-32x5/16" Hex Nut.
80-368	Idler Wheel Tension Spring
93-673	Idler Wheel Stud Washer (Small)
93-677	Idler Wheel Fishpaper Washer-(Large)
93-678	Idler Wheel Fishpaper Washer-(Small)
93-679	Idler Wheel Stud Felt Washer
93-900	Motor Mtg. Washer (Fibre)(3 used)
93-903	Motor Mtg. Washer (Steel)(3 used)
125-61	Rubber Grommet (3 used)
141-108	Phono Motor
159-50	Cinch Plug Button
188-32	Retaining Ring (4 used)

ADD:

S-15224	Cobra Tone Arm Assy. (Complete) Consisting of:		
	S-15222	Cartridge Assy. (Complete) (Green)	3.50
	S-15226	Tone Arm Hinge Plate & Brkt. Assembly	.75
	S-15228	Hinge Plate Final Assy.	1.25
	56-144	Socket Retaining Pin	.05
	78-561	Cartridge Socket	.15

Part No.	Description	Price
	80-605 Socket Tension Spring	.10
	83-1121 Felt Strip	.01
	112-619 #2x5/16" R.H. Self Tapping Screw Cad. Pl. (3 used)	.02
	135-13 Counterweight	.30
	148-106 Plastic Tone Arm-Only	.75
S-15238	Motor & Lever Assembly	12.50
S-15313	Cobra Tone Arm Assy. (Complete) Consisting of:	
	S-11473 Cobra Tone Arm Cartridge Assembly	3.50
	S-13046 Swivel Brkt. & Bushing & Pin Assy.	.60
	S-13060 Hinge Plate Spring & Swivel Brkt. Assembly	1.00
	S-13061 Socket, Hinge Plate & Stop Assembly	1.50
	S-15311 Shielded Lead Assy.	.40
	S-15312 Hinge Plate Assy. (Complete)	1.75
	56-144 Pin (Socket Retaining)	.05
	56-199 Weight	.01
	78-561 Socket	.15
	80-605 Socket Tension Spring	.10
	83-1121 Felt Strip	.01
	112-619 #2x5/16" Self Tapping Screw Cad. Pl. (3 used)	.02
	148-83 Tone Arm Housing-Only	.75
27-111	Spacer Disk	.01
32-26	Dual Speed Belt	.20
43-171	Tone Arm Support Housing	.25
43-173	Record Ejector Housing	1.75
56-260	Groove Pin-3/32" dia. x3/4" lg. Cad. Pl.	.02
57-1452	Speed Indicator Plate	.35
57-1454	Switch Lever Retainer Plate	.01
57-1459	Switch Plate	.10
61-125	Idler Wheel	.75
84-68	Tone Arm Rest	.08
85-372	Three Position Switch	.34
94-654	Motor Mtg. Bushing	.07
112-581	#6x3/8" R.H. Self Tapping Screw (2 used on 43-171)	.75C
112-637	#4-40x1/4" B.H.M.S. Steel N.P. (2 used on 85-372)	.01
114-248	#6x5/16" Hex. Hd. Slotted Self Tapping Screw Cad. Pl. (used on 84-68)	.01
117-162	Switch Lever	.04
125-12	Rubber Grommet	.04
125-45	Rubber Grommet	.03
125-71	Motor Mtg. Grommet (3 used)	.04

ZENITH

REG U S PAT OFF

SERVICE MANUAL

MODELS S14012, S14014, S14019 AND S14021 AUTOMATIC RECORD CHANGERS

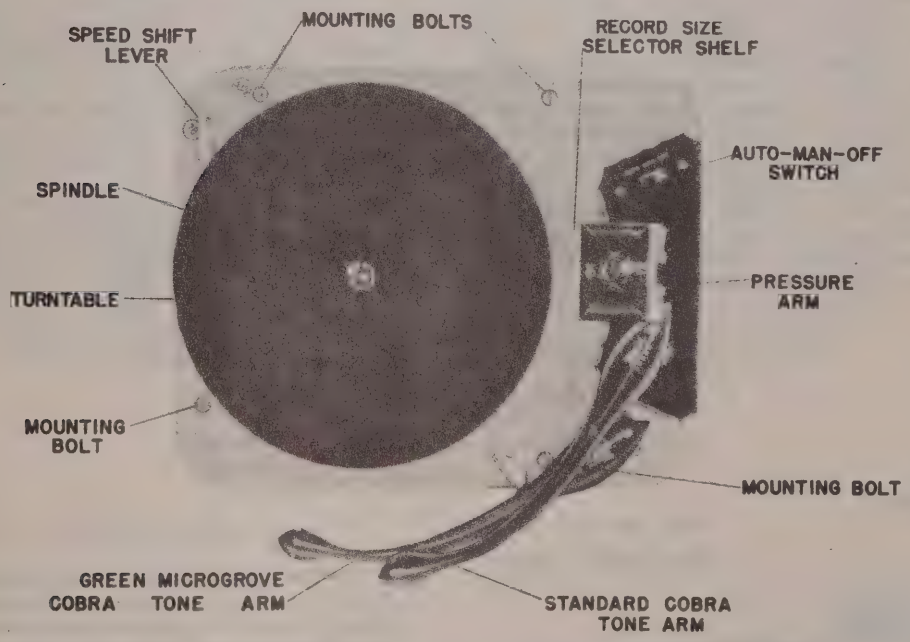


Fig. 1. S14012 and S14014 Record Changers.

GENERAL

The Models S14012 and S14014 record changers are used in Zenith Models 9H995RLP and 6R980LP respectively. These changers are designed to play 12 ten inch or 10 twelve inch 78 RPM records automatically. They will play 33-1/3 RPM records manually. Odd size and warped records must be played manually. Mechanically the changers are alike. There are slight electrical differences. Model S14012 receives the solenoid energizing voltage from the receiver proper while the S14014 supplies its own energizing voltage from a separate winding on the motor. When servicing these changers, check the schematic diagrams for electrical differences. The mechanical operation and adjustments of both changers are identical. To load for automatic 78 RPM operation, set the record size selector shelf to either ten or twelve, depending on the size of the records to be played. Lift the pressure arm and place a stack of records over the spindle. Lower the pressure arm until it rests on the record stack. Set the AUTO-MAN-OFF switch to AUTO. Move the speed shift lever to 78 RPM and press the record change button on the receiver panel. The record changer will play the complete selection of records, and will repeat the last record until turned off. For manual operation set the AUTO-MAN-OFF switch to MAN, place a record on the turntable and set the needle on the starting groove of the record. For 78 RPM records use the standard tone arm and place the speed shift lever to 78 RPM. For 33-1/3 RPM records use the green tone arm and place the speed shift lever to 33-1/3 RPM. To turn the changer off, set the AUTO-MAN-OFF switch to OFF, and place the tone arm in the rest position.

DESCRIPTION OF CYCLING

The motor drives the turntable thru the media of shafts and idler wheels. Closing the contacts of the trip switch or the record change switch allows current to flow through the solenoid. The magnetic field of the energized solenoid attracts the trip pawl lever which releases the gear pawl tooth and allows it to engage the rotating turntable gear. This action starts the clutch gear to turn. A stud on the clutch gear engages the tone arm lift lever which engages the tone arm stud and raises the tone arm. The tone arm lift lever also applies the tone arm brake which prevents coasting and erratic landing of the needle. The clutch gear moves the tone arm actuating lever and laterally swings the tone arm off the turntable. During the lateral swing of the tone arm, the record ejector link and arm assembly operates the record push plate and when the tone arm moves to its maximum outward position, the record push plate ejects the record and allows it to drop on the turntable. The clutch gear then moves the tone arm actuating lever which swings the tone arm over the starting groove of the record. The tone arm swings 1 inch nearer the spindle with 10 inch records than it does with 12 inch. This difference in inward swing is controlled by the discriminator lever assembly. When the record size selector shelf is turned to the 10 or 12 inch position, its shaft moves the discriminator cam and sets the discriminator lever assembly for the correct inward swing of the tone arm. After the tone arm swings over the starting groove of the record, the tone arm lift lever lowers it and releases the brake. As the clutch gear completes the revolution, the gear pawl tooth bracket hits the trip pawl and the action removes the gear pawl tooth from the path of the turntable gear, causing the clutch gear to stop thus completing the cycle.

The velocity trip depends on the ratio of oscillations of the trip switch contact to the rate of movement of the tone arm. As the record is played, the tone arm lever moves slowly inward. The oscillating lever comes in contact with the ratchet on the tone arm lever and then moves out before the ratchet can drag the oscillating lever and close the trip switch contacts. When the record is completed and the needle enters the oscillating groove, the inward speed of the tone arm increases. This makes it impossible for the oscillating lever to move out of the ratchet in time and as a result is dragged inward, closing the trip switch contacts and starting the next cycle.

The S14012 and S14014 record changers use the famous Cobra pickup. On S14012, S14014 and S14019, use only a red cartridge in the red tone arm and only a green cartridge in the green tone arm. On S14021 which has a red tone arm use only a red-green cartridge. Previously published service manuals Z800 and Z801 explain in detail the theory and operation of the Cobra pickup. If these manuals are not available, they may be obtained from your Zenith distributor.

RECORD CHANGER MOUNTING CLIPS

Clamp on pivot clips are used to mount the record changer in the cabinet. The changer is released by applying an upward pressure to the slotted ends of the clips (see Fig. 3) until the clips pivot to a vertical position. When the changer is installed, the clips are pivoted back to the horizontal or holding position.

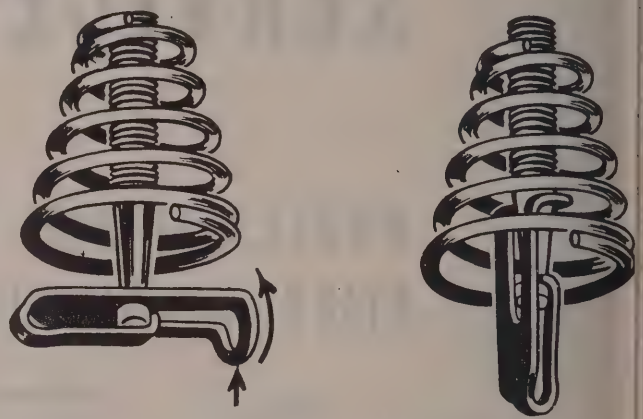


Fig. 3. Record Changer Mounting Clip.

LUBRICATION

Sta-Put grease No. 512 (light grease of the vaseline type) i used for lubrication throughout. Fig. 7 indicates the various lub brication points. Do not apply grease to the top surface or teet of the clutch gear.

ADJUSTMENTS

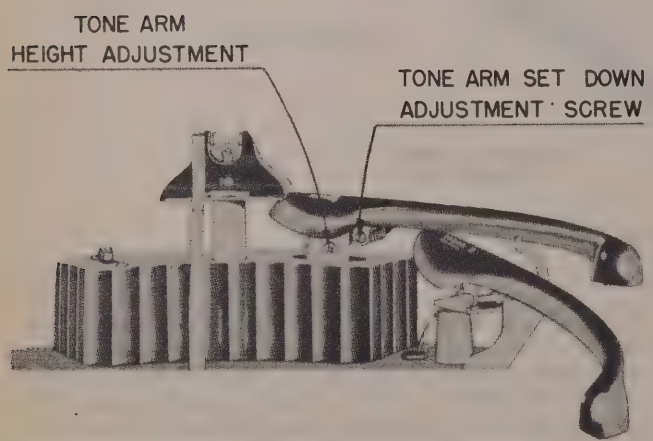


Fig. 2. Tone Arm Set Down and Height Adjustment.

TONE ARM SET DOWN ADJUSTMENT

The landing position of the needle on the record is determined by the setting of the tone arm set down adjustment screw (see Fig. 2). Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

TONE ARM HEIGHT ADJUSTMENT

The tone arm height adjustment determines the vertical ris of the tone arm. If the tone arm does not rise sufficiently, th record changer will not play a full load of 12 ten inch record: If, on the other hand, the tone arm is raised too high, it may h the records on the record shelf. Set the adjustment screw s that the needle clears 12 unwarped ten inch records on the turn table. The tone arm housing must not hit the underside of th records on the record shelf when the changer is cycled aft adjustment.

TRIP SWITCH ADJUSTMENT

The tone arm lever must be moved so that its ratchet do not engage the oscillating switch lever. With a pair of lo nose pliers simultaneously bend the stationary contact and gu spring until the spacing between the trip switch contacts is 1/ inch to 3/32 inch. The contact spring must always rest agai the heavier guide spring after adjustment.

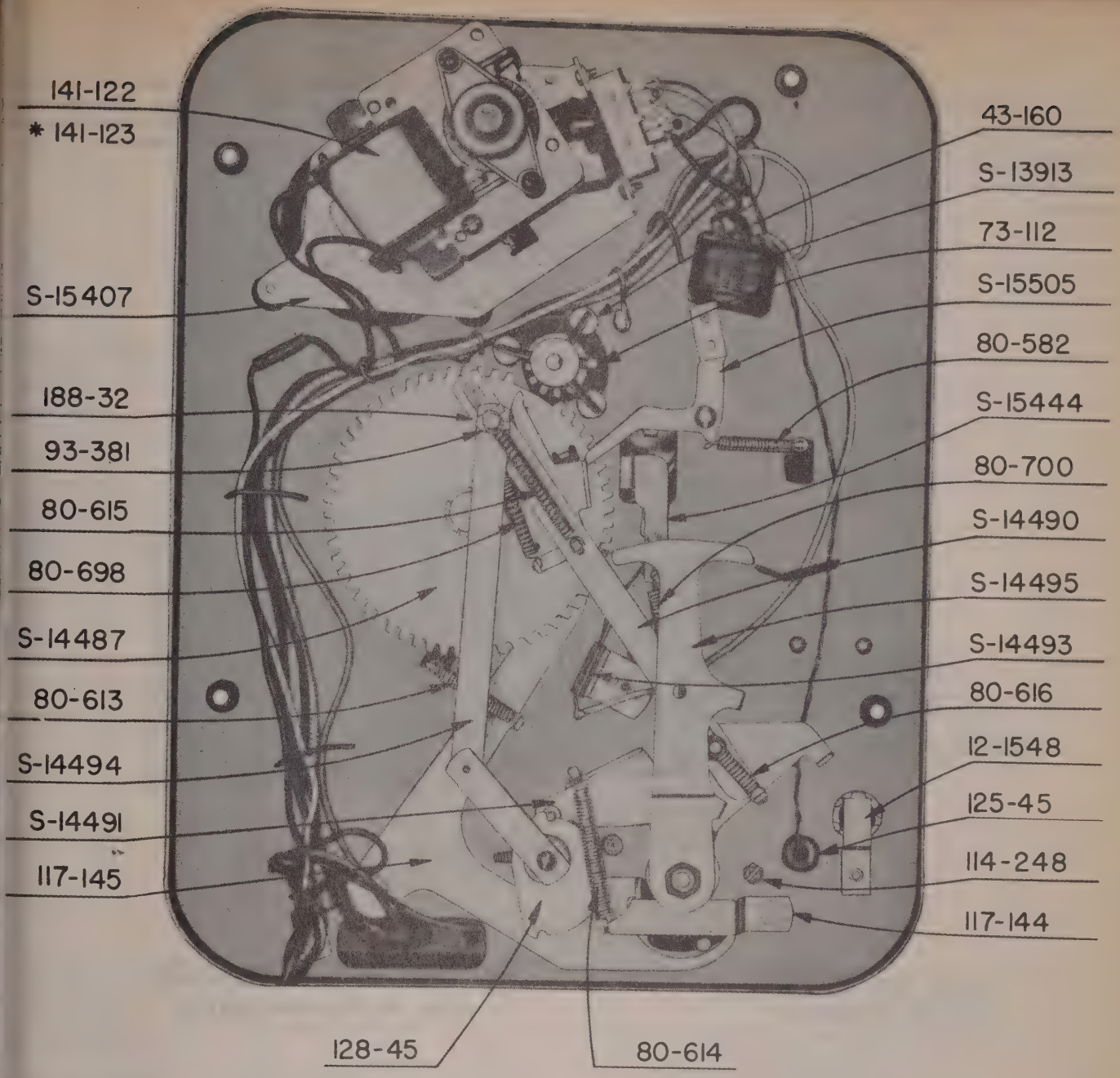


Fig. 4. Bottom View.

SLAB HEAD SET SCREWS

For maximum rigidity, the spindle, discriminator cam and ne arm lever are locked in position with slab head screws. slab head set screw wrench is available as Zenith part No. -8.

REMOVING THE 78 RPM TONE ARM ASSEMBLY

The complete tone arm assembly can be removed by loosening two slab head holding screws and pulling the unit out. When tone arm assembly is installed, the cone points of the slab ad screws must enter the indentations previously made. A w assembly does not have these indentations, and must be sembled as follows:

1. See that the changer mechanism is out of cycle.
2. Turn the tone arm set down adjustment screw (see Fig. 2) as far as it will go in the clockwise direction.
3. Insert the tone arm support shaft through its mounting hole.
4. Place a 12 inch record on the turntable and hold the Cobra tone arm housing against the edge of the record. Move the tone arm lever (Part No. S14495) to its maximum outward position. These two positions must be maintained during the next operation.
5. See that the tone arm lever bushing has approximately .005 inch play and tighten the slab head screws.
6. Adjust the tone arm set down adjustment screw (see Fig. 2) for proper landing of the needle.

REMOVING THE RECORD SHELF

The record shelf is removed by unscrewing the slab head screw at the bottom of its shaft and the machine screw which holds the record ejector link. When the unit is assembled, see that the changer is out of cycle and turn the slotted shaft until the record push off plate is retracted into its housing before attaching the record ejector link.

Figs. 5. & 6. illustrate the items involved in the two speed drive mechanism.

On 78 RPM operation the motor drive shaft comes in contact with idler wheel S15383 and in turn this idler wheel drives the turntable.

On 33 1/3 operation the motor drive shaft drives the idle wheel S15383. A flange on the lower portion of this idler whee drives a second idler wheel S15382. This second idler whee drives the slow speed drive plate on the turntable. See Fig. 6

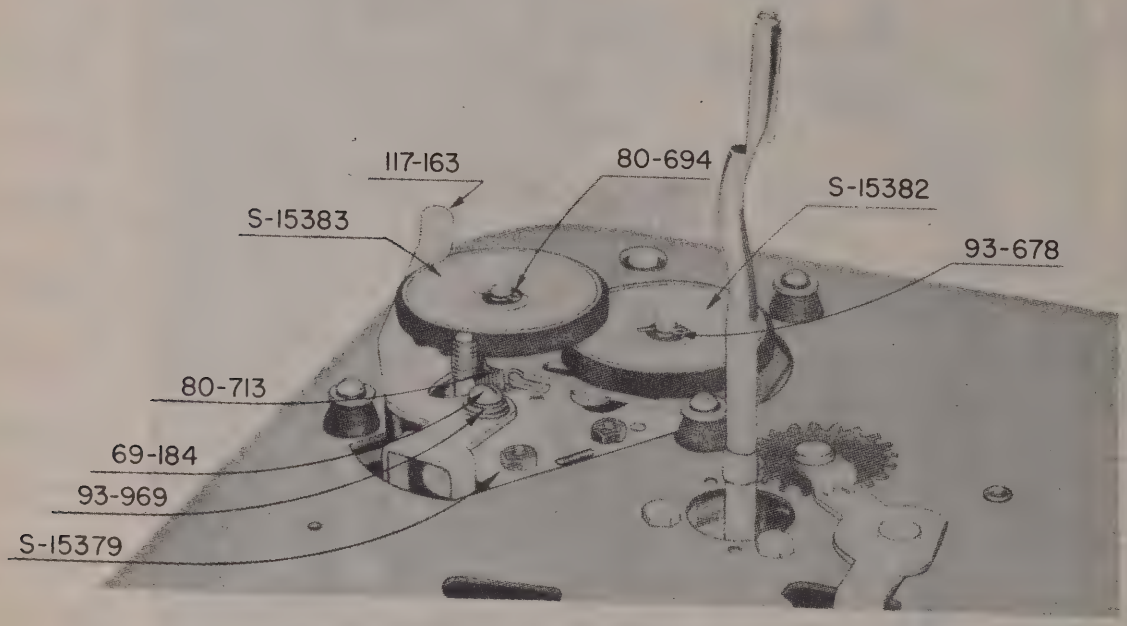


Fig. 5. Speed Changing Mechanism.

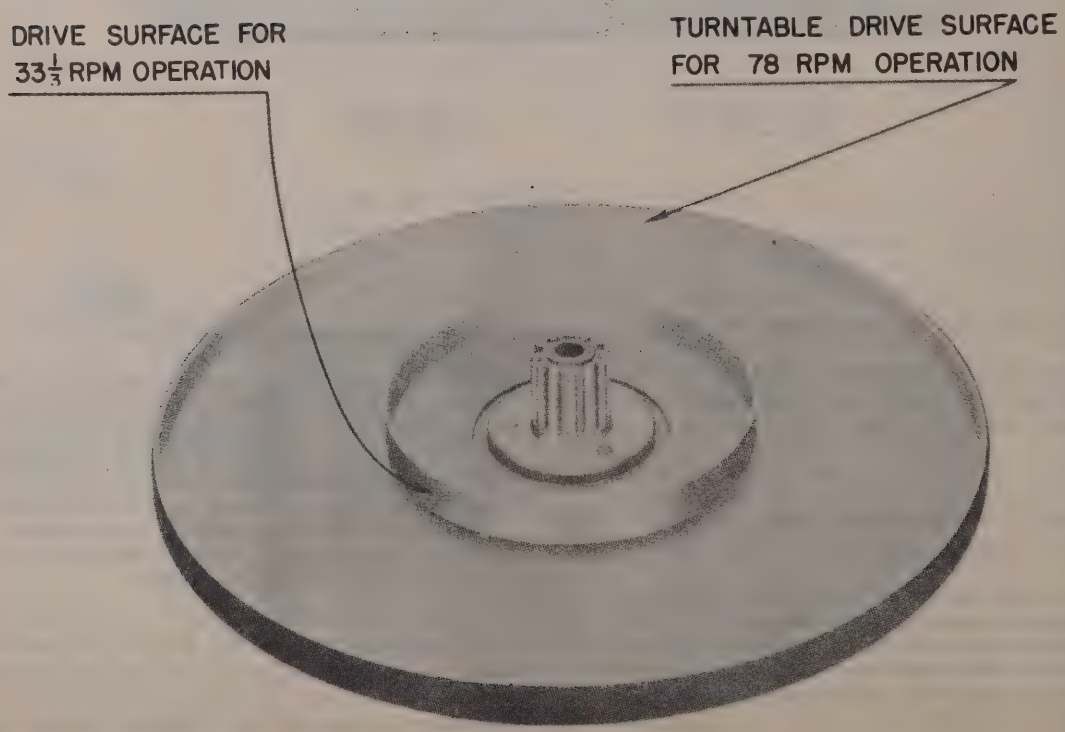


Fig. 6. Turntable Assembly S15411.

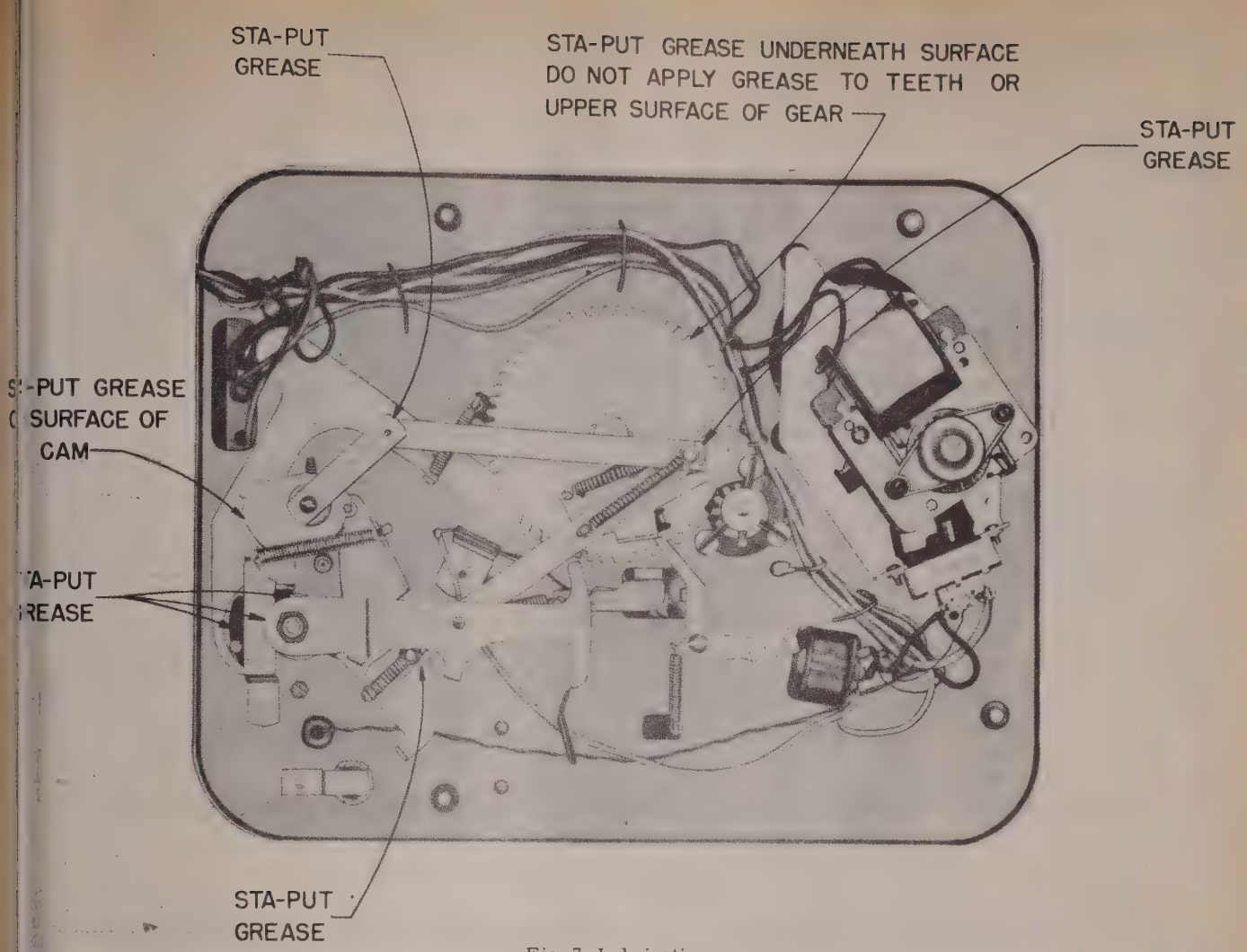


Fig. 7. Lubrication.

TROUBLE SHOOTING

UEAKS OR NOISES DURING PLAYING OF RECORDS.

a. Friction between the records on the turntable and the indle will occasionally cause squeaks. A thin coat of wax plied to the spindle will remedy this condition.
b. Check lubrication.

CORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

a. See that the Phono Radio switch is on Phono.
b. Check receiver audio by listening to radio.
c. Check the phono oscillator tube.
d. Check Needle Cartridge.
e. Check Tone Arm Housing for broken leads.

ESSING RECORD CHANGE BUTTON ON RECEIVER PANEL ES NOT START RECORD CHANGE CYCLE.

a. See that the AUTO-MAN-OFF switch is set to AUTO.
b. Check Record Change Switch.
c. Check electrical continuity of solenoid circuit.
d. Check the solenoid energizing voltage.

MBLE AND MICROPHONICS DURING REPRODUCTION.

a. Changer not "floated" properly. Remove packing strip. osen mounting bolts.
b. Motor retaining rings rubbing on the idler wheel.
c. Motor leads pulled too tight preventing motor from oating" freely.
d. Noisy phono oscillator tube.
e. Impression on Idler Wheel.

EDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS THE TURNTABLE.

a. Check Tone Arm height adjustment.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

a. Check Tone Arm set down adjustment.

TONE ARM SET-DOWN POSITION VARIES.

a. Check Tone Arm Brake and Spring.
b. Tone Arm pivots loosely.

CHANGER CONTINUES TO CYCLE.

a. Check the trip switch adjustment.
b. Check Record Change switch.
c. Trip Pawl sticks.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

a. See that the AUTO-MAN-OFF switch is set to AUTO.
b. Be certain that the record has an eccentric center groove.
c. Check the Trip Switch.
d. Check the solenoid energizing voltage.

SOLENOID FAILS TO TRIP MECHANISM.

a. Check the pawl lever positioning stud. The tip of the pawl must be in approximately the same position in relation to the gear pawl tooth lever as indicated at "A" in Fig. 4. If the position is not the same as indicated, the positioning stud can be bent slightly.
b. Tension on the trip pawl actuating spring too high.

MECHANISM JAMS.

a. Burr or sharp point on the gear pawl tooth. Smooth out with a small file.

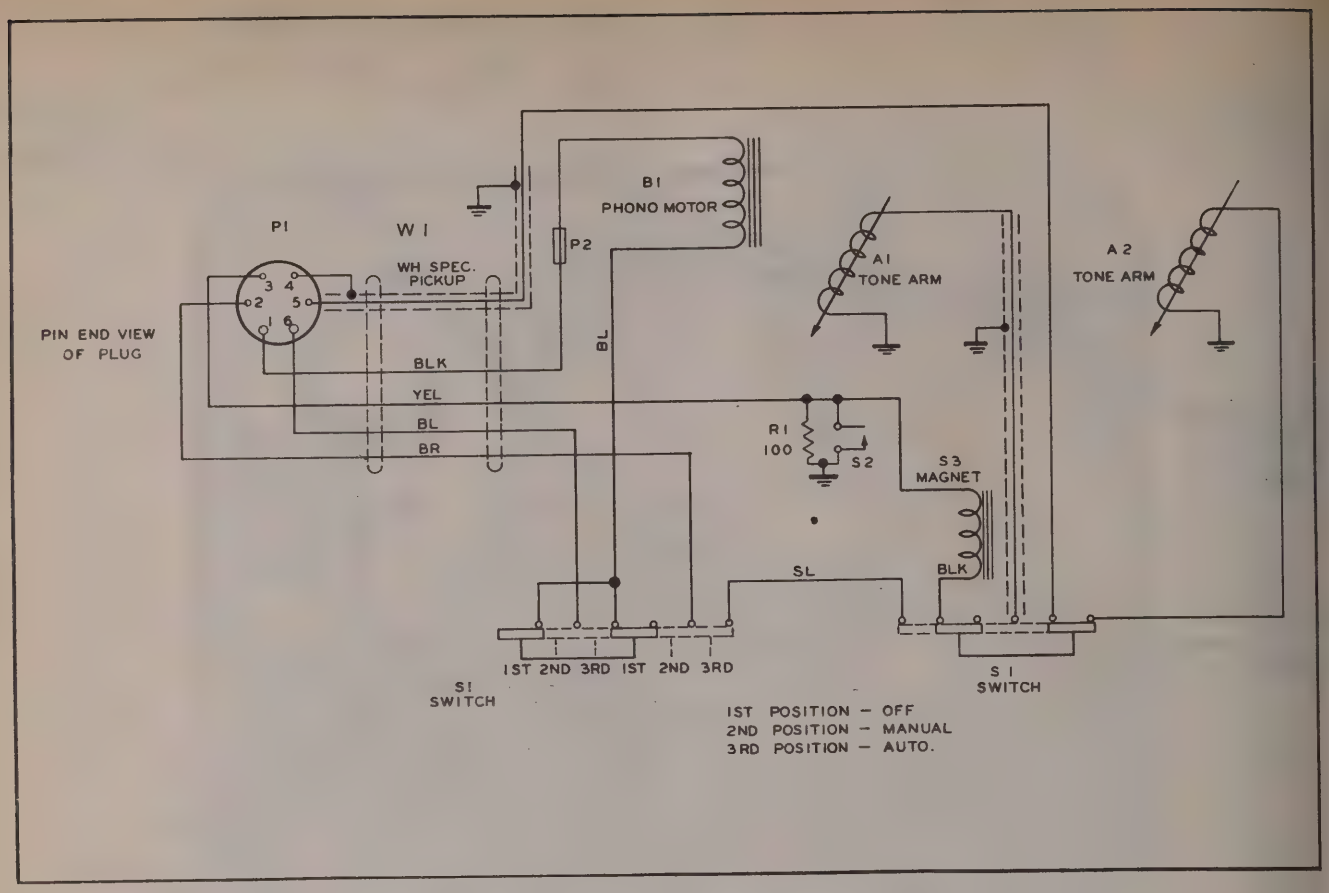


Fig. 8. Schematic Diagram S14012 Record Changer.

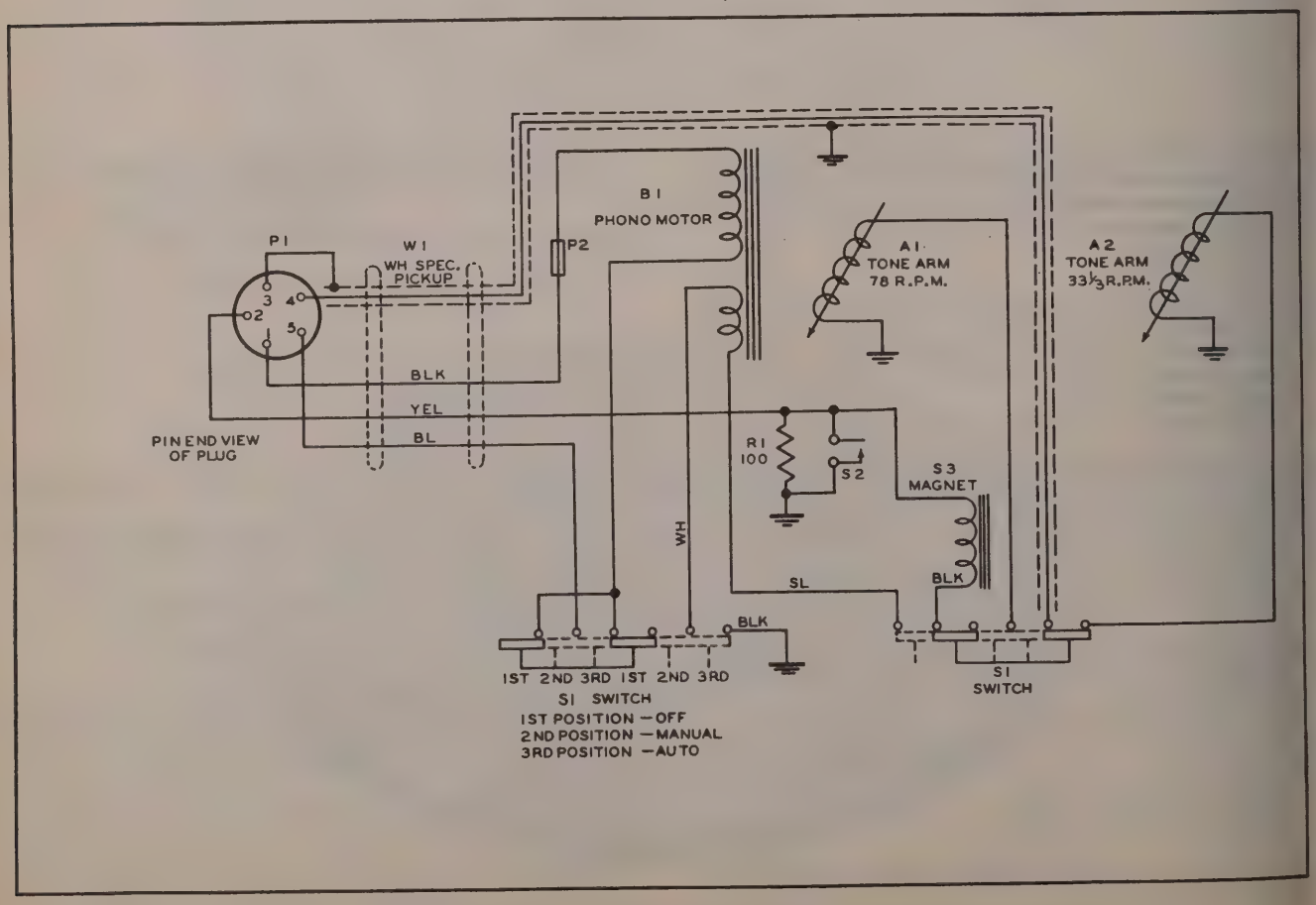


Fig. 9. Schematic Diagram S14014 Record Changer.

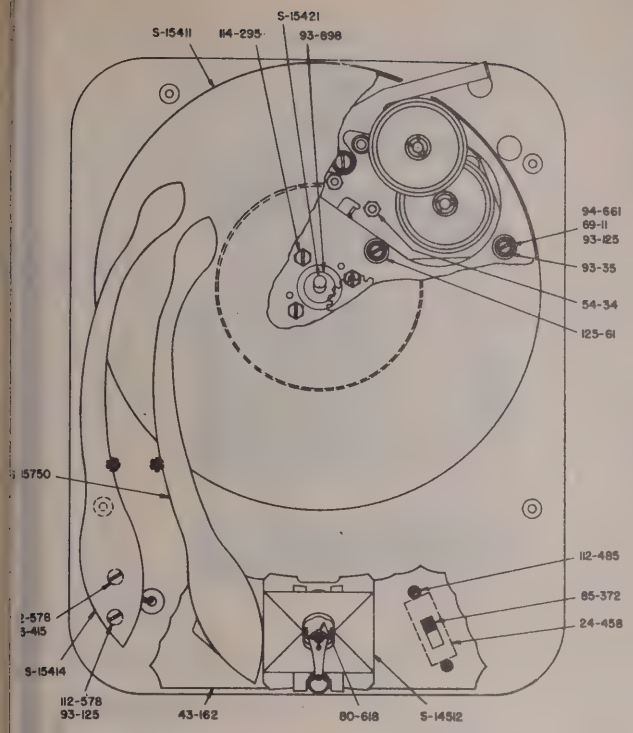


Fig. 10. Parts Identification, Top View.

81	Cable Clamp	.04
88	Cable Clamp	.04
22	A.C. Wire Connector	.05
458	Switch Cover	.15
160	Turntable Gear Assembly	.70
162	Record Ejector Housing	1.10
144	Socket Retaining Pin	.05
240	Groove Pin (2 used on S-14521)	.07
1375	Record Push Plate	.45
1577	Record Post Adj. Plate	.20
158	Five Prong Plug (Used on S-15466)	.14
166	Six Prong Plug (Used on S-15443)	.20
1744	100 Ohm Ins. 1/2W. Res.	.21
430	Shoulder Rivet (6 used)	.21
431	Shoulder Rivet (2 used)	
11	#6-32 X 3/4" R.H.M.S. Steel N.P.	.70C
43	#8-32 X 3/8" R.H.M.S. Steel N.P.	.70C
141	#5-40 X 1/4" R.H.M.S. Steel N.P.	.70C
184	#8-32 X 1/4" R.H.M.S. Steel Cad.	.70C
262	#8-32 X 1/2" Phillip R.H.M.S. Steel Stat. Bronze	.85C
99	#8-32 X 1/4" Slab. Hd. Set Screw Cone Pt (2 used)	.02
112	#8-32 X 1/2" Slab. Hd. Set Screw Cuppoint	.02
121	Special Set Screw	.12
123	Allen Hd. Set Screw - cone point	.12
538	Tone Arm Shaft (33 1/3 R.P.M.)	.85
561	Cartridge socket	.15
844	Socket (45 R.P.M. Adaptor)	
582	Pawl Spring	.10
605	Socket Tension Spring	.10
609	Landing Adj. Spring	.03
610	Switch Contact Spring	.03
613	Lift Pin Lever Spring	.10
614	Brake Spring	.10
615	Tone Arm Link Spring (Long)	.10
616	Tone Arm Link Spring (Short)	.10
618	Pressure Arm Spring	.15
619	Tone Arm Swivel Spring	.15
631	Pawl Spring	.05
645	Tone Arm Height Adj. Spring	.10
650	Lever Spring (Fast Speed)	.05
692	Detent Lever Spring	.15
694	Idler Wheel Retaining Spring	.15
698	Pawl Spring	
700	Oscillating Lever Spring	.10
737	Oscillating Lever Tension Spring	.25
738	Oscillating Lever Spring	.20
739	Trip Pawl Spring	
1121	Felt Strip	.01
372	Three Position Slide Switch	34

93-35	.032 X .144 X 3/8" Steel Washer N.P. (3 used)	.25C
93-53	1/32" X 11/64" X 3/8" Steel Washer N.P.	.01
93-125	#6 Int. Shakeproof Lockwasher (5 used)	.31C
93-381	1/32" X 7/32" X 3/8" Steel Washer - Cad.	.02
93-415	#6 Ext. Shakeproof Lockwasher	.25C
93-781	#8 Split Lockwasher Steel N.P.	.23C
93-876	Fibre Washer	.02
93-898	Steel Washer	.02
93-899	Steel Washer N.P. .025 X .129 X 5/16"	.60C
93-969	Spring Washer, Shakeproof	.05
94-620	Stop Bushing	.10
94-659	Tone Arm Shaft Bushing	.70
94-661	Motor Mounting Bushing (3 used)	.05
97-298	Trip Pawl Stud	.10
97-301	Clutch Gear Retaining Stud	.20
97-329	Change Lever Spring Stud	.20
97-333	Change Lever Mounting Stud	.20
112-485	#4-40 X 1/4" B.H.M.S. Steel Black Zinc Plate (4 used)	.63C
112-619	#2 X 5/16 R.H.S.T. Screw Cad. Plate Shakeproof Type #25 (3 used)	.02
114-248	#6-20 X 5/16" Hex. Hd. Slotted S.T.Screw Steel Cad. (4 used)	.01
114-295	#8-32 X 5/16" Hex. Hd. Slotted S.T. Screw Steel Cad. (4 used)	.75C
117-144	Brake Lever	.20
117-145	Tone Arm Lift Lever	.50
117-163	Speed Control Lever	.25
117-164	Detent Lever	.15
125-61	Rubber Grommet (3 used)	.03
125-65	Rubber Grommet Pressure Arm	.15
135-13	Counterweight	.30
x135-14	Counterweight	.30
128-45	Discriminator Cam	.50
141-122	Phono Motor A.C. 110V 60 Cycle	7.50
*141-123	Phono Motor A.C. 110V 60 Cycle	7.50
148-83	Tone Arm Housing	.75
148-96	Record Ejector Arm	.20
148-97	Record Pressure Arm	.35
148-109	Plastic Tone Arm Only	.75
149-60	Magnet Core	.10
x159-32	Plug Button	.04
x159-73	Plug Button	
x159-74	Plug Button	
188-32	Retaining Ring	1.03C
199-85	Tone Arm Sleeve	.15
S-13913	Magnet Coil Assembly	.65
S-14487	Clutch Gear Assembly	2.00
S-14490	Tone Arm Actuating Lever Assembly	1.00
S-14491	Discriminator Lever Assembly	.50
S-14493	Trip Switch Assembly	1.25
S-14494	Record Ejector Link & Arm Assembly	.70
S-14495	Tone Arm Lever Assembly	1.25
S-14499	Ejector Cam Shaft Assembly	1.50
S-14510	Record Support Plate & Post Assembly	2.00
S-14512	Pressure Arm & Mounting Assembly	2.00
S-14513	Tone Arm Shaft Assembly	1.25
S-14514	Tone Arm Bracket & Lift Pin Assembly	1.00
S-14516	Tone Arm Assembly (78 R.P.M.) or S-15428	
S-14673	Hinge Plate Socket & Stop Assembly	.60
S-15379	Motor Mounting Plate Assembly	1.25
S-15380	Speed Change Lever & Stud Assembly	.25
S-15381	Detent Lever & Stud Assembly	.35
S-15382	Idler Wheel Lever & Stud Assembly (Slow Speed)	.25
S-15383	Idler Wheel Lever & Stud Assembly (Fast Speed)	.25
S-15384	Idler Wheel Lever & Swivel Plate Assembly	.35
S-15407	Dual Speed Mechanism Final Assembly - Complete	4.00
S-15411	Turntable Assembly	2.50
S-15414	Cobra Tone Arm Assembly (33 1/3 R.P.M.)	
S-15421	Spindle Assembly (or S-14496 with 147-157)	
S-15428	Cobra Tone Arm Assembly (78 R.P.M.)	
S-15443	Cable & Plug Assembly	2.50
*S-15466	Cable & Plug Assembly	2.50
S-15444	Oscillating Lever & Gear Assembly	1.50
S-15451	Hinge Plate Assembly - Complete	.80
S-15453	Hinge Plate & Socket Assembly	.50
S-15454	Hinge Plate Assembly - Complete	.70
S-15505	Trip Pawl Assembly	.55
xS-15780	Red-Green Cobra Cartridge Assembly	1.65
12-1444	Socket Mounting Bracket	.01
12-1447	Tone Arm Mounting Bracket (Upper)	.03
12-1548	Tone Arm Shaft Pivot Bracket	

* Denotes Parts Used On S-14014 Only
x Denotes Parts Used OnS-14021 Only
Those that are blank denote parts used on S-14012, S-14014, S-14019 & S-14021

The S14019 is identical to the S14012 except it uses a 50/60 cycle phono motor #141-124 motor and a 85-445 phono reject switch mounted on the record changer base plate. For 50 cycle operation the 60 cycle spring on the phono motor drive shaft must be replaced with a 50 cycle spring #80-732. See fig. 13 for electrical circuit.

The S14021 is identical to the S14012 except the S14021 has only one Cobra Tone Arm which contains a red-green cartridge. This cartridge allows both 33-1/3 and 78 R.P.M. 10" and 12" records to be played. 10" and 12" records can be played automatically but are not to be intermixed. The electrical circuit is shown in fig. 14.

To adjust the velocity trip switch assembly proceed in the following manner. Adjust trip pawl spring 80-739 so that the end of the spring is in line with an imaginary center line through the center of the shoulder rivet and the coil spring 80-738. (See fig. 12).

Rotate the turntable until the oscillating lever has moved as far to the right as possible Spring 80-739 should just touch the ratchet on the tone arm lever assembly at a point that is 3/8" from the end of the lever (See fig. 12). The spring should be adjusted by bending it until it will conform to the prescribed limits. Only when the velocity trip switch assembly is adjusted in this manner will the changer trip properly.

When the tone arm fails to track, and jumps grooves, the pivot bearing pressure is too great, this inhibits the movement of the arm. This can be corrected by loosening the lock nut (See fig. 11) and with the use of an Allen wrench adjust the pivot bearing so it will be free enough to allow the tone arm to track properly. Holding the pivot bearing in this position, tighten the lock nut.

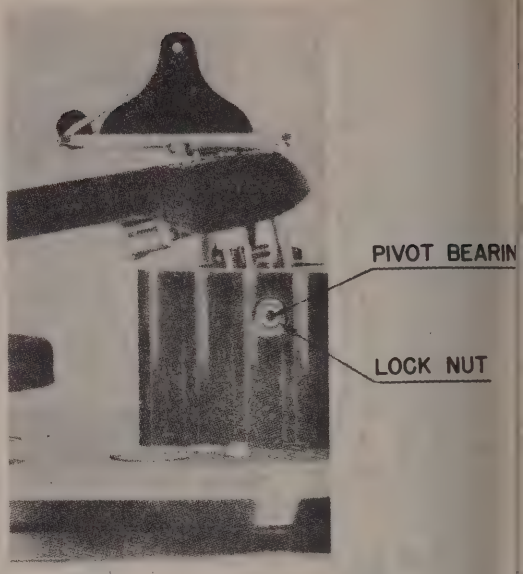


Fig. 11. Pivot Pressure Adjustment.

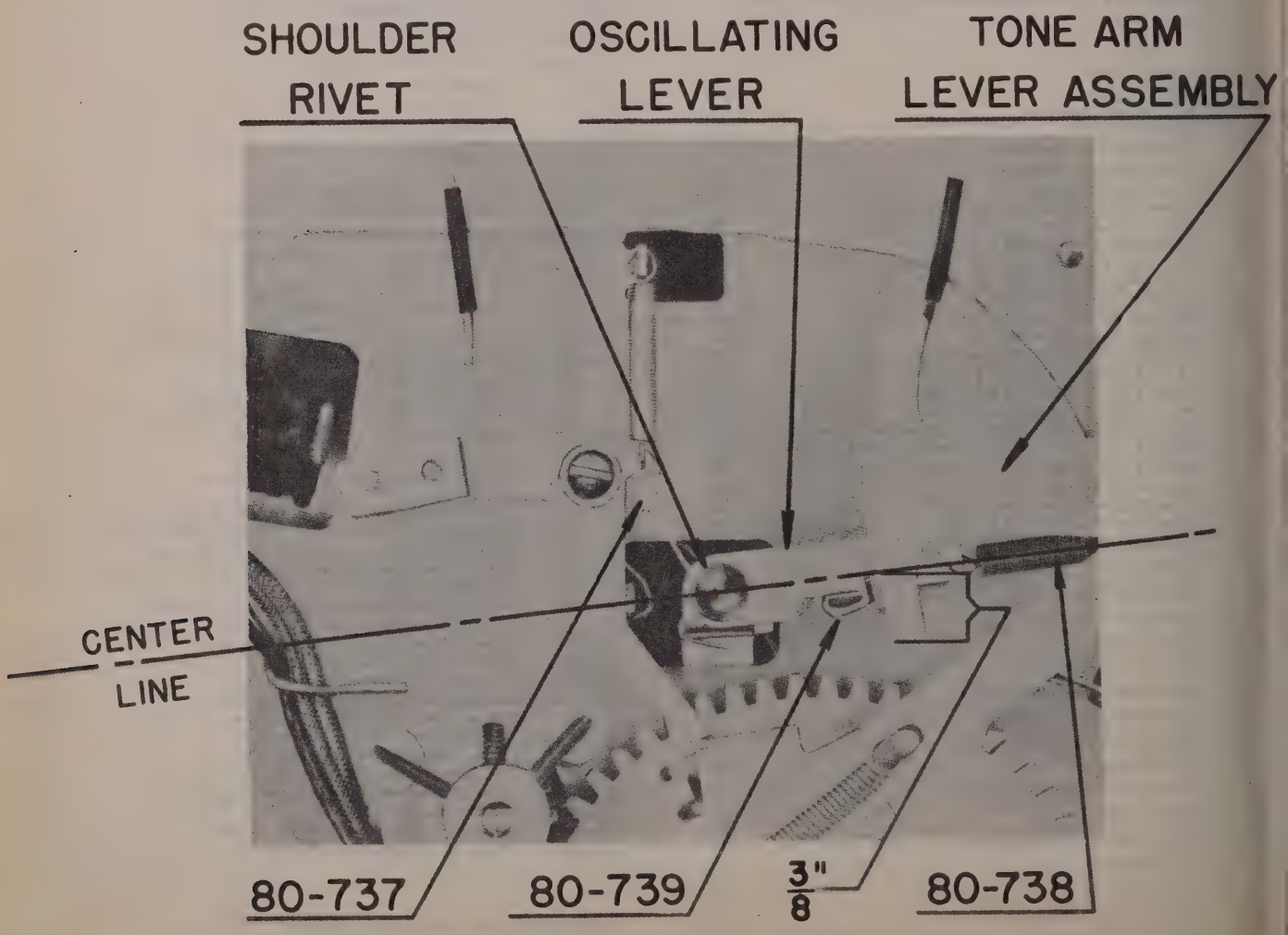


Fig. 12. Velocity Trip Adjustment.

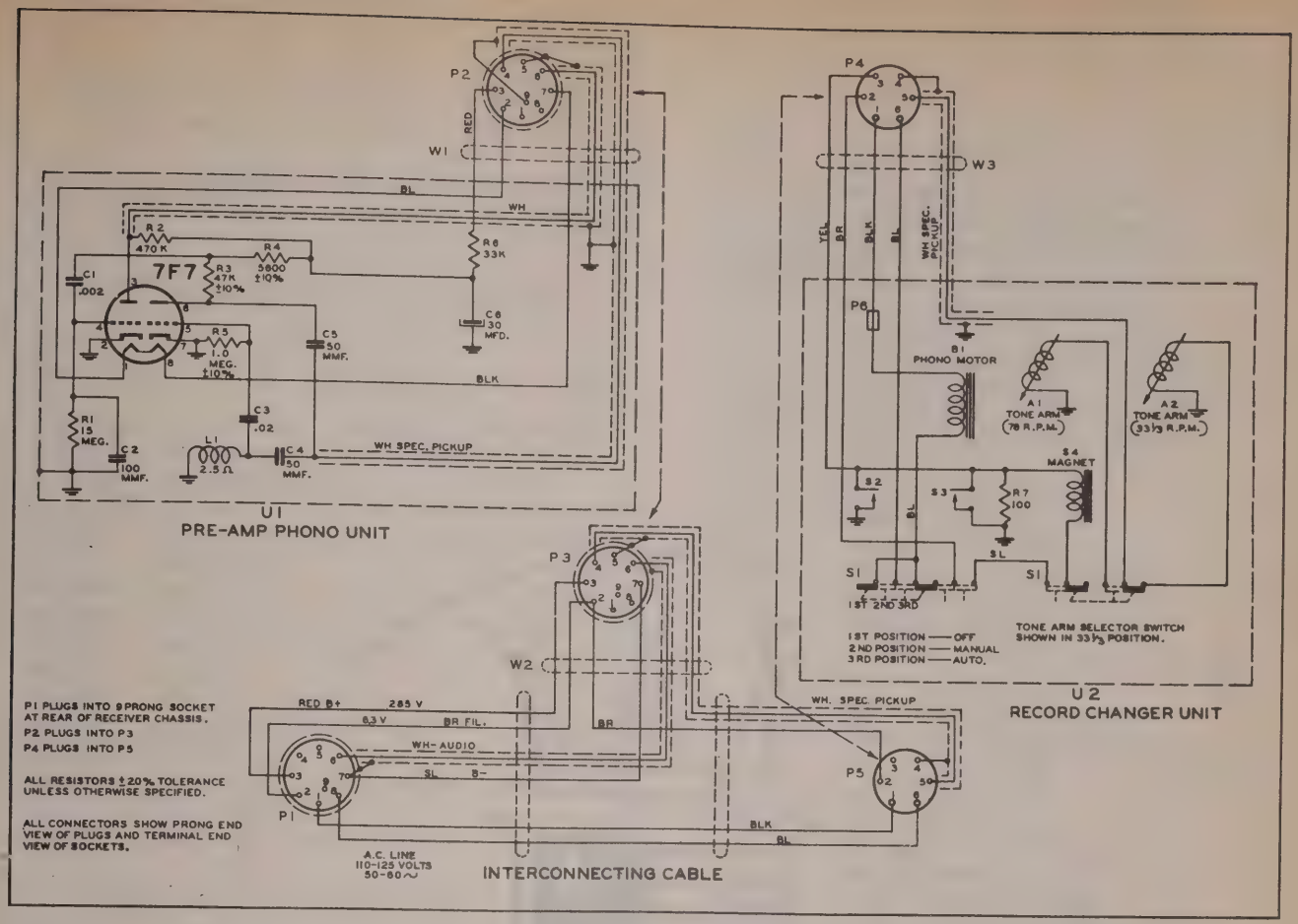


Fig. 13. Schematic For S14019.

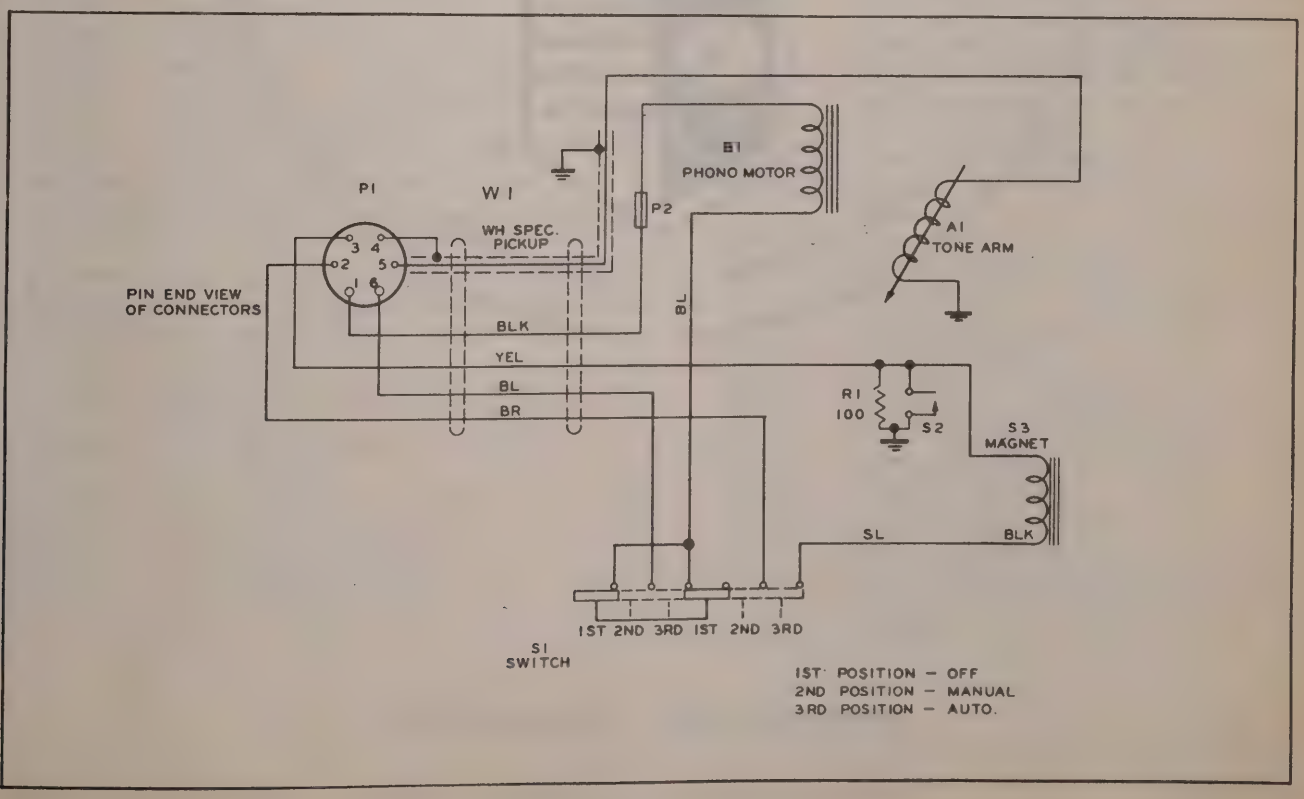


Fig. 14. Schematic For S14021.

ZENITH RADIO CORPORATION

Form Z901 6001 Dickens Ave. Chicago 39, Ill. Printed in U.S.A. r.r

S14013 Dual Speed Intermixer Record Changer (Used on 9H981LP-9H985LP-9H988LP)

S14013 Dual Speed Intermixer Record Changer is the same as S14009 except it uses S15488 Dual Speed mechanism.

TONE ARM ASSEMBLY (78 R.P.M.)

Part No.	Description	Price
S-15313	Cobra Tone Arm Assy. Complete	
S-15312	Hinge Plate Assy. Complete	1.75
S-15311	Shielded Lead Assy. or S-15332	.40
S-13061	Socket, Hinge Plate & Stop Assy.	1.50
S-13060	Hinge, Plate Spring & Swivel Brkt. Assembly	1.00
S-13046	Swivel Brkt. & Bushing & Pin Assy.	.60
S-11473	Cobra Tone Arm Cartridge Assy.	3.50
56-144	Pin (Socket Retaining)	.05
56-199	Weight	.01
78-561	Socket	.15
80-605	Socket Tension Spring	.10
83-1121	Felt Strip	.01
112-619	#2x5/16" R.H.S.T. Screw Cad. Pl. (3 used)	.02
148-83	Tone Arm Housing-Only	.75

TONE ARM ASSEMBLY (33-1/3 R.P.M.)

S-15228	Hinge Plate Final Assembly	1.25
S-15226	Tone Arm Hinge Plate & Brkt. Assembly	.75
S-15224	Cobra Tone Arm Assy. Complete	
S-15222	Cobra Cartridge (Green)	3.50
56-144	Socket Retaining Pin	.05
78-561	Cartridge Socket	.15
80-605	Socket Tension Spring	.10
83-1121	Felt Strip	.01
112-619	#2x5/16" R.H.S.T. Screw Cad. Pl. (3 used)(or 112-753)	.02
135-13	Counterweight	.30
148-106	Plastic Tone Arm Only (Green)	.75

S-15488 DUAL SPEED MECHANISM ASSEMBLY

S-15488	Dual Speed Mechanism Complete	7.50
S-15487	Speed Change Lever & Stud Assy.	.25
S-15384	Idler Wheel Lever & Swivel Plate Assembly	.35
S-15383	Idler Wheel Lever & Stud Assy. (Fast Speed)	.25
S-15382	Idler Wheel Lever & Stud Assy. (Slow Speed)	.25
S-15381	Detent Lever & Stud Assy.	.35
S-15379	Motor Mtg. Plate Assy.	1.25
61-134	Idler Wheel (Slow Speed)	.80
61-135	Idler Wheel (Fast Speed)	1.10
80-692	Detent Lever Spring	.15

Part No.	Description	Price
80-694	Idler Wheel Retaining Spring	.15
80-713	Spring, Lever (Fast Speed)	.10
93-53	1/32x11/64x3/8 Steel Washer N.P.	.01
93-678	Fishpaper Washer (4 used)	.33C
93-969	Spring Washer Shakeproof #3544-14	.05
12-1216	Tone Arm Pivot Brkt.	.16
12-1390	Solenoid Mtg. Brkt.	.02
12-1556	Spindle Support Brkt. (Upper)	.10
12-1557	Spindle Support Brkt. (Lower)	.15
19-88	Cable Clip	.02
19-150	Housing Cover Clip	.03
27-111	Spacer Disc	.01
43-148	Tone Arm Housing	1.10
43-154	Tone Arm Support Housing	.30
43-171	Tone Arm Support Housing	.25
43-173	Record Ejector Housing	1.75
54-30	#8-32x5/16x7/64" Hex. Nut Steel N.P.	.31C
56-226	Tone Arm Lift Pin (Lower)	.15
56-227	Tone Arm Lift Pin (Upper)	.10
56-260	Groove Pin Type #2-3/32" dia. x3/4" Long Cad. Pl.	.02
57-1476	Switch Plate	.15
57-1479	Adapter Plate (Dual Speed Mechanism)	.15
57-1483	Speed Indicator Plate	.35
58-169	Phono Plug (used on S-14229)	.20
69-43	#8-32x3/8" R. H. M. S. Steel N.P. (used on S-13913)	.70C
71-71	#6-32x1/4" Phillips Flat Hd. M.S. Steel N.P. (2 used on S-11671)	.01
71-81	#8-32x2-3/4" Flat Hd. M.S. Steel N.P. (used on S-11674)	.05
73-99	#8-32x1/4" Slab Hd. SetScrew Steel Conespoint (2 used on S-15313)	.02
73-100	#8-32x1/2" Slab Hd. Set Screw Steel Conespoint (2 used on S-11683 1 used on 12-1216)	.02
76-373	Timing Sprocket Shaft	.10
80-418	Tension Spring (Pressure Arm) (2 used)	.05
80-462	Cam Spring	.10
80-479	Spring (Spindle Dog)	.01
80-531	Brake Spring	.04
80-538	Landing Adjustment Spring	.02
80-544	Contact Spring	.03
80-545	Contact Spring	.03
80-572	Clutch Spring (used on S-15503)	.06
80-574	Pawl Pusher Brkt. Spring	.06
80-575	Contact Spring	.02
80-582	Pawl Spring	.10
80-584	Tone Arm Lift Spring	.01
80-653	Trip Arm Spring	.07
84-68	Tone Arm Rest (2 used)	.08
85-372	Three Position Slide Switch (2 used)	.34

Part No.	Description	Price
93-125	#6 Internal Shakeproof Lockwasher #1206 (4 used)	.31C
93-126	#8 Internal Shakeproof Lockwasher #1208 (2 used)	.36C
93-415	#6 External Shakeproof Lockwasher #1106	.25C
93-617	Sprocket Shaft Retaining Washer	.77C
93-719	7/16x3/16x.037" Flat Washer Cad. Pl. (5 used) (2 used on S-10732 - 3 used on S-11674)	.35C
93-764	Spring Washer Shakeproof #3759-14	1.40C
93-767	Cam Spacer Washer .020x.385x5/8 Steel Cad. Pl.	1.30C
93-769	Steel Washer Cad. Pl.	.03
93-781	#8 Split Lockwasher Steel N.P.	.23C
93-811	Cam Spacer Washer (.012x.385x5/8") Brass	.02
93-812	Cam Spacer Washer (.016x.385x5/8") Brass	.02
93-813	Cam Spacer Washer (.025x.385x5/8") Brass	.02
93-814	Cam Spacer Washer (.030x.385x5/8") Brass	.02
93-815	Cam Spacer Washer (.005x.385x5/8") Brass	.02
93-844	#5 External Shakeproof Lockwasher	.35C
93-876	Fibre Washer	.02
93-936	Special Steel Washer	.03
93-976	Steel Washer	.07
93-977	Felt Washer	.01
94-415	Tone Arm Locating Bushing	.21
94-661	Motor Mtg. Bushing (3 used)	.05
94-662	Clutch Drive Bushing (used on S-15503)	.45
94-663	Cam Spring Mtg. Bushing	.02
94-664	Drive Shaft Bushing	1.25
112-576	#5-40x1/4" Oval B.H.M.S. Steel (used with S-12686)	.30C
112-581	#6x3/8" R.H.S.T. Screw Shakeproof Type 25 Cad. Pl. (1 used on 43-154 - 2 used on 43-171)	.75C
112-637	#4-40x1/4" B.H.M.S. Steel N.P. (2 used on 85-372 - 2 used on S-15523)	.01
112-706	#4-40x1/4" R.H.M.S. Steel N.P. (Int. Shakeproof Lockwasher)(1 used on 94-415)	.02
114-88	#8-32x1/2" Hex Acorn Hd. M. S. Steel N.P. (2 used on 12-1216)	.55C
114-89	#8-32x5/16" Hex. Acorn Hd. M. S. Steel N.P. (3 used on S-11674)	.43C
114-201	#8x5/16" Hex Hd. Slotted S.T. Stan. Tap. Cad. (11 used)	.75C
114-248	#6-20x5/16" Hex. Hd. Slotted Shakeproof Type #25 S.T. Cad. Pl. (19 used)	.01
114-293	#6-32x3/8" Hex Hd. Slotted M.S. Steel Cad. Pl. (2 used on 12-1556)	.02
114-295	#6x1/4" Hex Hd. S. T. Shakeproof Type #25 Cad.	.02
125-61	Rubber Grommet (Motor Mtg.) (3 used)	.03
149-60	Magnet Core	.10
166-30	Rubber Bumper (used on S-11671)	.03
166-41	Rubber Bumper (used on S-15500)	.03
188-27	Retaining Ring (1 used on S-13872 & 1 used on S-15499)	1.20C
188-121	Clutch Pawl Retaining Ring	.15
214-4	Sprocket Drive Chain	.75
S-10732	Idler Assembly	1.17
S-11668	Record Ejector Cam & Shaft Assy.	1.34
S-11671	Pressure Arm & Brkt.	.79
S-11674	Record Support Plate Mtg. Brkt. Assy.	2.13
S-11675	Discriminator Mtg. Brkt. Assy.	.36
S-11683	Selector Sprocket & Bushing Assy.	.73
S-12507	Record Spindle Assembly	3.63
S-12686	Cam & Washer	.05
S-12859	Discriminator Knob & Plate Assy.	.35
S-13461	Record Ejector Housing Cover Assembly	1.25
S-13872	Trip Plate & Bushing Assy.	.30
S-13900	Timing Sprocket Assy.	.65
S-13901	Trip Switch Assembly	1.10
S-13902	Tone Arm Pivot Shaft & Brkt.	1.15
S-13913	Magnet Assembly	.65
S-14229	Cable Assembly	2.00
S-14313	Muting Switch Assembly	.30
S-15494	Turntable Assembly	2.50
S-15496	Turntable Shaft, Plate & Bearing Assembly	1.15
S-15499	Drive Sprocket & Bushing	.25
S-15500	Clutch Release Arm Assy.	.65
S-15503	Clutch Pawl Assy.	.75
S-15523	Motor & Change Mechanism Assy.	15.00

MISCELLANEOUS CONDENSERS & RESISTORS

22-1775	.047 Mfd. (or 22-1756 or 22-1914) 400V	.26
63-1744	100 ohm 1/2W ± 20% Ins. Res.	.21
63-1779	680 ohm 1/2W ± 20% Ins. Res.	.21

MODEL S-14015 INTERMIXER RECORD CHANGER
(Used on 12H990LP)

S14015 Intermixer Record Changer is the same as S14016 Record Changer except:

OMIT:

S-13461	Record Ejector Housing Cover Assembly

Part No.	Description	Price
S-13494	Record Support Plate Mtg. Brkt. Assembly	
S-13496	Discriminator Mtg. Brkt. Assy.	
S-15313	Cobra Tone Arm Assy. (78 R.P.M.)	
43-148	Tone Arm Housing	
43-154	Tone Arm Support Housing	
43-171	Tone Arm Support Housing	
43-173	Record Ejector Housing	
57-1290	Switch Escutcheon	
84-68	Tone Arm Rest (2 used)	
ADD:		
S-11675	Discriminator Mtg. Brkt. Assy.	.36
S-12038	Record Ejector Housing Cover Assembly	.36
S-14666	Record Support Plate Mtg. Assy.	1.65
S-15338	Cobra Tone Arm Assy.	
43-103	Tone Arm Housing	.88
43-153	Tone Arm Support Housing	.30
43-172	Tone Arm Support Housing	.25
43-174	Record Ejector Housing	1.75
57-1397	Switch Esc. (or 57-1290)	.25
84-65	Tone Arm Rest (2 used)	.08

S14016 Dual Speed Intermixer Record Changer (Used on 14H989RLP)

S14016 Dual Speed Intermixer Record Changer is the same as S14011 except it uses S15488 Dual Speed mechanism.

TONE ARM ASSEMBLY (78 R.P.M.)

Part No.	Description	Price
S-15313	Cobra Tone Arm Assy. Complete	
S-15312	Hinge Plate Assy. Complete	1.75
S-15311	Shielded Lead Assy. or S-15332	.40
S-13061	Socket, Hinge Plate & Stop Assy.	1.50
S-13060	Hinge Plate Spring & Swivel Brkt. Assembly	1.00
S-13046	Swivel Brkt. & Bushing & Pin Assembly	.60
S-11473	Cobra Tone Arm Cartridge Assy.	3.50
56-144	Pin (Socket Retaining)	.05
56-199	Weight	.01
78-561	Socket	.15
80-605	Socket Tension Spring	.10
83-1121	Felt Strip	.01
112-619	#2x5/16 R.H.S.T. Screw Cad. Pl. (3 used)	.02
148-83	Tone Arm Housing - Only	.75

TONE ARM ASSEMBLY (33-1/3 R.P.M.)

Part No.	Description	Price
S-15228	Hinge Plate Final Assembly	1.25
S-15226	Tone Arm Hinge Plate & Brkt. Assembly	.75
S-15224	Cobra Tone Arm Assy. Complete	
S-15222	Cobra Cartridge (Green)	3.50
56-144	Socket Retaining Pin	.05
78-561	Cartridge Socket	.15
80-605	Socket Tension Spring	.10
83-1121	Felt Strip	.01
112-619	#2x5/16" R.H.S.T. Screw Cad. Pl. (3 used)(or 112-753)	.02
135-13	Counterweight	.30
148-106	Plastic Tone Arm Only (Green)	.75

S-15488 DUAL SPEED MECHANISM ASSEMBLY

S-15488	Dual Speed Mechanism Complete	7.50
S-15487	Speed Change Lever & Stud Assy.	.25
S-15384	Idler Wheel Lever & Swivel Plate Assembly	.35
S-15383	Idler Wheel Lever & Stud Assy. (Fast Speed)	.25
S-15382	Idler Wheel Lever & Stud Assy. (Slow Speed)	.25
S-15381	Detent Lever & Stud Assembly	.35
S-15379	Motor Mtg. Plate Assembly	1.25
61-134	Idler Wheel (Slow Speed)	.30
61-135	Idler Wheel (Fast Speed)	1.10
80-692	Detent Lever Spring	.15
80-694	Idler Wheel Retaining Spring	.15
80-713	Spring Lever (Fast Speed)	.10
93-694	1/32x11/64x3/8 Steel Washer N.P.	.01
93-678	Fishpaper Washer (4 used)	.33C
93-969	Spring Washer Shakeproof #3544-14	.05
12-1216	Tone Arm Pivot Brkt.	.16
12-1335	Auto. Stop Switch Mtg. Brkt.	.02
12-1338	Shut-Off Switch Brkt.	.15
12-1390	Solenoid Mtg. Brkt.	.02
12-1556	Spindle Support Brkt. (Upper)	.10
12-1557	Spindle Support Brkt. (Lower)	.15
15-64	Plug Cap & Insulator (Used on S-13915)	.06
19-88	Cable Clip	.02
19-150	Housing Cover Clip	.03
27-111	Spacer Disc	.01
43-148	Tone Arm Housing	1.10
43-154	Tone Arm Support Housing	.30
43-171	Tone Arm Support Housing	.25
43-173	Record Ejector Housing	1.75
54-30	#8-32x5/16x7/64 Hex. Nut Steel N.P.	.31C
54-246	#4-40x3/16x3/32 Hex. Nut Steel Cad. (used with 187-9)	.01

Part No.	Description	Price
56-226	Tone Arm Lift Pin (Lower)	.15
56-227	Tone Arm Lift Pin (Upper)	.10
56-260	Groov-Pin Type #2-3/32 dia. x3/4 lg. Cad.	.02
57-1290	Switch Escutcheon	.20
57-1479	Adapter Plate (Dual Speed Mechanism)	.15
57-1483	Speed Indicator Plate	.35
58-133	Phono Plug	.12
69-11	#6-32x3/4 R.H.M.S. (3 used on S-15524)	.70C
69-43	#8-32x3/8 R.H.M.S. Steel N.P. (2 used)	.70C
69-217	#4-40x3/16 R.H.M.S. Steel N.P. (used on S-14874)	.01
69-246	#5-40x1/2 R.H.M.S. Steel N.P. (2 used on S-13430)	.50C
71-71	#6-32x1/4 Phillips Flat Hd. M. S. Steel N.P. (2 used on S-11671)	.01
71-81	#8-32x2-3/4" F.H.M.S. Steel N.P. (used on S-13494)	.05
73-99	#8-32x1/4 Slab. Hd. Set. Screw Steel Conept. (2 used on S-15313)	.02
73-100	#8-32x1/2 Slab Hd. Set Screw Steel Conept. (1 used on 12-1216 2 used on S-11683)	.02
76-373	Timing Sprocket Shaft	.10
80-418	Tension Spring (Pressure Arm)	.05
80-462	Cam Spring	.10
80-479	Spring (Spindle Dog)	.01
80-531	Brake Spring	.04
80-538	Landing Adj. Spring	.02
80-572	Clutch Spring	.06
80-574	Pawl Pusher Brkt. Spring	.06
80-575	Contact Spring	.02
80-582	Pawl Spring	.10
80-584	Tone Arm Lift Pin Spring	.01
80-653	Trip Arm Spring	.07
80-656	Shut-Off Switch Spring	.08
84-68	Tone Arm Rest (2 used)	.08
85-372	Three Position Switch	.34
85-405	On-Off Switch	.45
85-406	Auto. Manual Switch	.25
93-125	#6 Internal Shakeproof Lockwasher #1206 (4 used)	.31C
93-126	#8 Internal Shakeproof Lockwasher #1208 (3 used)	.36C
93-415	#6 External Shakeproof Lockwasher #1106	.25C
93-617	Sprocket Shaft Retaining Washer	.77C
93-719	7/16x3/16x.031 Flat Washer Cad. (4 used)	.35C
93-764	Spring Washer (Shakeproof #3759-14)	1.40C
93-767	Cam Spacer Washer (.020x .385x5/8 Steel Cad.)	1.30C
93-769	Steel Washer - Cad. Pl.	.03
93-781	#8 Split Lockwasher Steel N.P.	.23C
93-811	Cam Spacer Washer (.012x.385x 5/8 Brass)	.02
93-812	Cam Spacer Washer (.016x.385x5/8 Brass)	.02
93-813	Cam Spacer Washer (.025x.385x5/8 Brass)	.02
93-814	Cam Spacer Washer (.030x.385x5/8 Brass)	.02
93-815	Cam Spacer Washer (.005x.385x5/8 Brass)	.02
93-844	#5 External Shakeproof Washer	.35C
93-876	Fibre Washer	.02
93-936	Special Steel Washer	.03
93-976	Steel Washer	.07
93-977	Felt Washer	.01
94-415	Tone Arm Locating Bushing	.21
94-661	Motor Mtg. Bushing (3 used)	.05
94-662	Clutch Drive Bushing	.45
94-663	Cam Spring Mtg. Bushing (2 used)	.02
94-664	Drive Shaft Bushing	1.25
112-576	5-40x1/4 Oval B.H.M.S. Steel N.P.	.30C
112-581	#6x3/8 R.H.S.T. Screw Shakeproof Type #25 Cad. (1 used on 43-154 - 2 used on 43-171)	.75C
112-637	#4-40x1/4 B.H.M.S. Steel N.P. (2 used on S-14874 - 2 used on S-15524)	.01
112-706	#4-40x3/16 R.H.M.S. Steel N. P. "SEMS" Int. Shakeproof Lockwasher	.02
114-88	#8-32x1/2" Hex. Acorn Hd. M.S. Steel N.P. (2 used on 12-1216)	.55C
114-89	#8-32x5/16 Hex. Acorn Hd. M.S. Steel N.P. (3 used on S-13494)	.43C
114-201	#8x5/16 Hex. Hd. Slotted - Stan-Tap S.T. Screw Cad. Pl. (11 used)	.75C
114-248	#6-20x5/16" Hex. Hd. Slotted Shakeproof Type 25 - S. T. Screw Steel Cad. Pl. (21 used)	.01
114-293	#6-32x3/8 Hex. Hd. Slotted M.S. Steel Cad. (2 used on 12-1556)	.02
114-294	#6x1/4" Hex Hd. S. T. Shakeproof Type #25 Cad.	.02
125-61	Rubber Grommet (Motor Mtg.) (3 used)	.03
149-60	Magnet Core	.10
166-30	Rubber Bumper (used on S-11671)	.03
166-41	Rubber Bumper (used on S-15500)	.03
187-9	Push Rod	.90
188-27	Retaining Ring (1 used on S-13872 - 1 used on S-15499)	1.20C
188-121	Clutch Pawl Retaining Ring	.15
214-4	Sprocket Drive Chain	.75
S-10732	Idler Assembly	1.17
S-11668	Record Ejector Cam & Shaft Assy.	1.34

Part No.	Description	Price
S-11671	Pressure Arm & Bushing Assy.	.79
S-11683	Selector Sprocket & Bushing	.73
S-12507	Record Spindle Assembly	3.63
S-12686	Cam & Washer Assembly	.05
S-12859	Discriminator Knob & Plate Assy.	.35
S-13430	Automatic Stop Switch Assy.	.80
S-13461	Record Ejector Housing Cover Assembly	1.25
S-13494	Record Support Plate Mtg. Brkt. Assembly	1.65
S-13496	Discriminator Mtg. Brkt. Assy.	1.00
S-13872	Trip Plate & Bushing Assembly	.30
S-13900	Timing Sprocket Assembly	.65
S-13901	Trip Switch Assembly	1.10
S-13902	Tone Arm Pivot Shaft & Brkt. Assembly (Second)	1.15
S-13913	Magnet Assembly	.65
S-13915	Cable Assembly	2.50
S-14313	Muting Switch Assembly	.30
S-14874	Shut-Off Switch Assembly	1.90
S-15494	Turntable Assembly	2.50
S-15496	Turntable Shaft, Plate & Bearing Assembly	1.15
S-15499	Drive Sprocket & Bushing Assy.	.25
S-15500	Clutch Release Arm Assy.	.65
S-15503	Clutch Pawl Assembly	.75
S-15524	Motor & Change Mechanism Assy. (141-112)	15.00

MISCELLANEOUS CONDENSERS & RESISTORS

22-417	0.1 Mfd.	600V	.26
22-1775	.047 Mfd. (or 22-1756 or 22-1914)	400V	.26
63-1744	100 ohm 1/2W 20% Ins. Res.		.21
63-1779	680 ohm 1/2W 20% Ins. Res.		.21
63-1954	10 Megohm 1/2W 20% Ins. Res.		.21

MODEL S14020 45 R.P.M. RECORD CHANGER

TONE ARM ASSEMBLY

2R3	Tone Arm Pivot Stud Screw	.10
4R6	Coil Spring (Counterbalance)	.05
5R18	Tone Arm Thrust Washer	.05
6R3	4-40x3/16" Fil. Hd. M. Screw	.03
7R11	Speednut (Phono Cable Anchor)	.03
RA2-5	Tone Arm Assy. Complete (with Cartridge)	11.00
RA33	2 Conductor Cable	.25
56-271	Sapphire Tip-Whisker Needle for 142-65	2.50
142-65	Electro-Voice Cartridge (8R4-3)	8.50
RA50	Tone Arm, Pivot Stud & Weight Assy. (less cartridge)	3.50

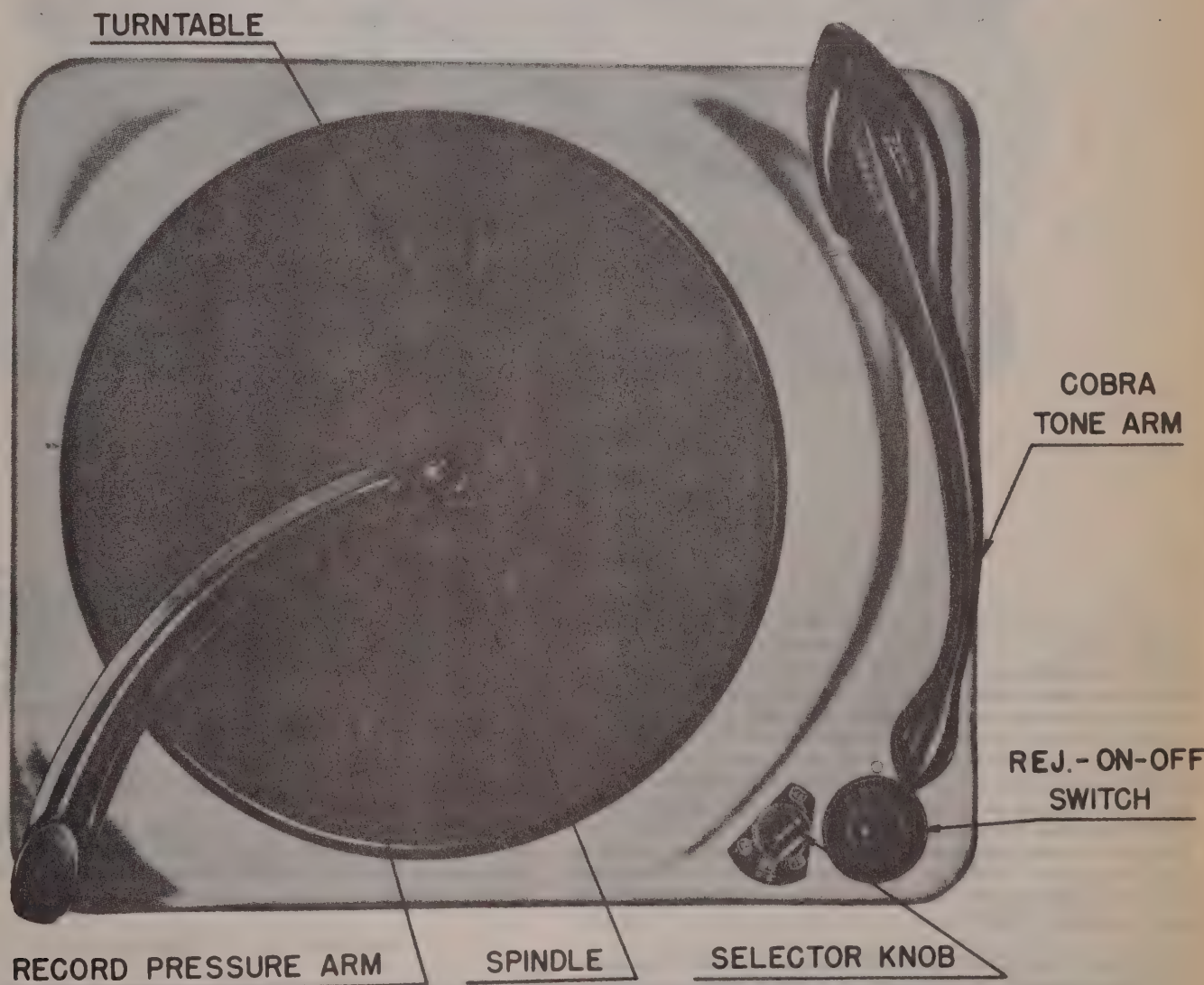
MISCELLANEOUS

1R4	Turntable Cam	.10
1R10	Mouting Brkt. (Muting Switch)	.10
1R13	Reject Plate	.10
1R18	Reject Plate	.10
1R21	Reject Coupling Lever	.05
1R24	Deflection Plate	.10
1R28	Switch Brkt.	.10
1R29	Cable Clamp	.05
2R2	Motor Spacing Bushing (3 used)	.05
2R23	Height Adj. Stud	.18
3R3	Spindle Nose (Red Top Only)	.40
3R7	Star Wheel	.20
3R15	Bottom Base (Cabinet)	.30
3R16-1	Push Button (2 used)	.10
4R2	Coil Spring (Reject Assy.) (2 used)	.05
4R3	Coil Spring (Safety Lever) (2 used)	.05
4R4	Coil Spring (Tone Arm Return)	.05
4R5	Coil Spring (Idler Pulley Plate)	.05
4R7	Coil Spring (Separator Bolt Spring)	.05
4R8	Coil Spring (Tone Arm Recoil)	.05
4R10	Coil Spring (Tone Arm Safety)	.05
4R11	Coil Spring (Trip Cushion)	.05
5R1	"C" Washer (Large)(to hold turntable to Bushing)	.05
5R2	"C" Washer (Small) (to hold Turntable to Bushing)	.05
5R17	Spring Washer (1 used set down adj. Stud - 1 used Height Adj. Stud)	.03
6R2	Cable Clamp Mtg. Screw	.03
6R8	Bristol Cup Pot. Set Screw (2 used on Star Wheel)	.10
6R22	Screws (4 used to Mtg. Bottom)	.03
7R3	Motor 110 Volt 60 Cycle	7.00
7R4	Rubber Grommet (3 used Motor mounting)	.05
7R13	Muting Switch	.70
7R21	"Off-On" Switch	1.00
7R38	Decal ("Off-On")	.05
8R12	Solderless Connector	.05
8R38	Combination Phono & A.C. Cable	1.50
8R41	Decal (Zenith)	.05
8R42	Rubber Feet (4 used)	.12
8R43	Instruction Sheet	
RA3	Trip Lever Assembly	.53
RA5	Bushing & Lever Assy.	.49
RA6	Trip Pawl Assembly	.28
RA7	Main Lever Assembly	.66
RA8	Lever & Stud Assembly	.23
RA9	Lever & Stop Assembly	.53
RA10	Idler Wheel & Bearing Assy.	2.00
RA16	Tone Arm Support Brkt. & Shaft Assembly	.37
RA20	Turntable & Shaft Assembly	3.80
RA21	Set Down Adjstment Stud	.13
43-179	Cabinet (3R14-1)	3.00

ZENITH

REG U S PAT OFF

SERVICE MANUAL



AUTOMATIC RECORD CHANGERS
MODELS S14022, S14024, S14025 & S14027

ZENITH RADIO CORPORATION
6001 DICKENS AVENUE • CHICAGO 39, ILLINOIS

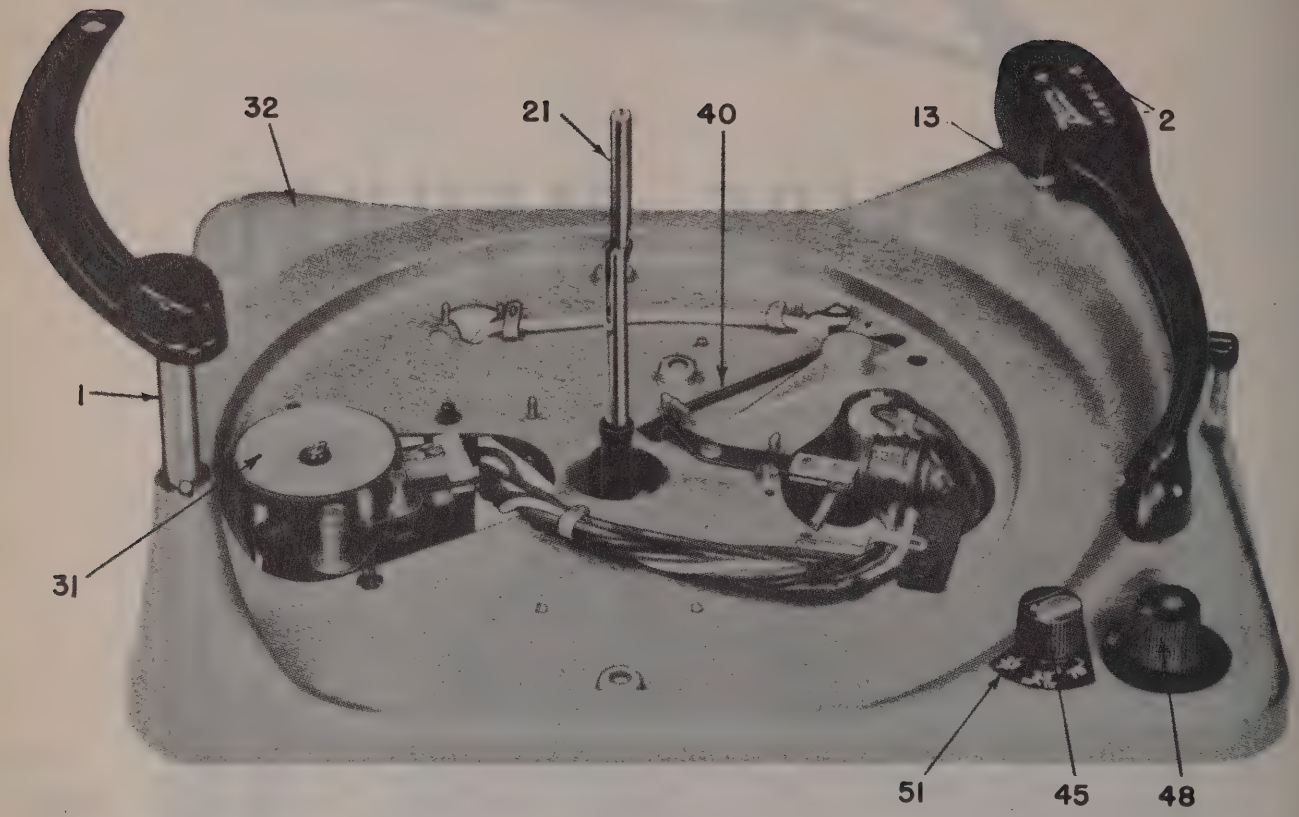


Fig. 1. Record Changer Top View.

GENERAL

The Zenith model S-14022, S-14024, S-14025 and S-14027 intermix record changers are designed to play standard 78 RPM, 45 RPM and 33-1/3 RPM records of standard commercial dimensions. With a few minor exceptions these four changers are alike, both electrically and mechanically. Models S-14022 and S-14024 have a solenoid reject mechanism. S-14022 has a 6 wire cable and socket and the S-14025 has a 4 wire cable and socket. Models S-14025 and S-14027 do not have the solenoid trip mechanism and they have separate phone and AC cables, the only difference between these two changers is the lead length. Features of these changers include playing and automatically changing as many as ten 12" or ten 10" records. Ten-inch and twelve-inch records of the same type can be intermixed, either standard (78 RPM) or long play (33-1/3 RPM).

A full stack of ten 7", 33-1/3 RPM records, or a full stack of ten 7", 45 RPM records (with the adapter inserted in the record) will also play on this changer. The changer shuts off after the last record has been played.

Connect this changer only to an outlet supplying 117 volts, 60 cycle AC unless otherwise specified. Power consumption 25 watts.

SHIPPING BOLTS

Before placing the record changer in operation, the machine must be floated freely on the mounting springs. During shipping, the mechanism is secured by means of the two shipping bolts. To float the changer, remove the turntable by lifting it straight u the spindle and turn out the two red stained record changer mount ing bolts. (Retain these two bolts in case of reshipment of th changer). When replacing the turntable be certain to push bac trip dog (84) and gently push back the idler wheel (31) while slowl lowering the turntable and turning it in a counter-clockwise direc tion. This is extremely important so that the turntable will nc damage the trip dog or idler wheel.

LEVELING RECORD CHANGER

It is essential to have the record changer absolutely level. Use torpedo or similar type level on the record changer baseplate Use adequate shims to level the record changer pan or radio com bination cabinet to achieve perfect level.

LOADING THE RECORD CHANGER

1. Pull straight up on record support knob (1A) until record sup port clears spindle. Swing record support to the left until pin shaft drops into locating groove.

2. Changer will automatically play ten 12" either standard or lon play, ten 10" either standard or long play, any assortment of te 12" and 10" records intermixed, or ten 7" long play or fine groov records.

NOTE: Standard, fine groove and long play records cannot b played in same stack of records. Motor speed control knob mus be reset for each type of recording.

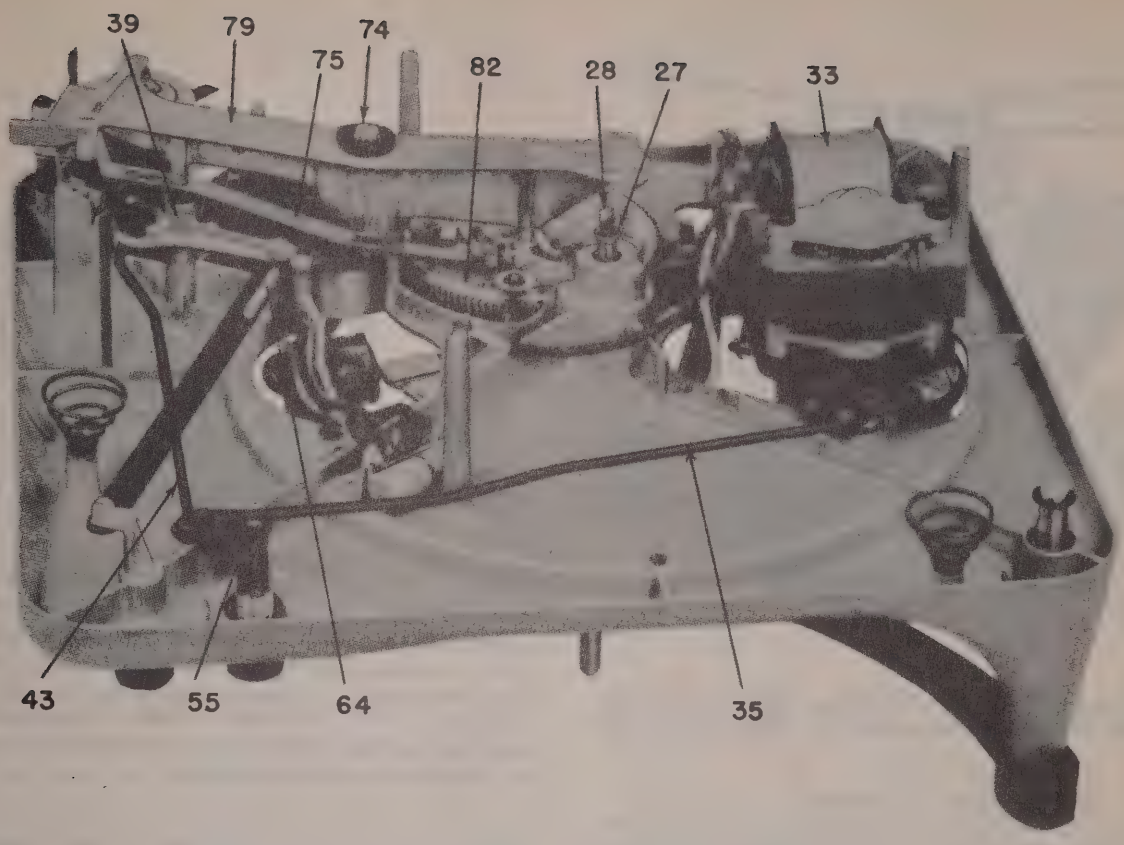


Fig. 2. Record Changer Bottom View

3. Place records on spindle and lower to offset shelf. Hold records level and replace record support (1) over spindle.

To Play Standard 78 RPM Recordings.

1. Motor speed control knob must be in the "78" position.

2. To start, turn changer control knob to "Rej." and release. Changer will operate automatically until the last record has been played. The pickup arm then returns to rest and the control knob automatically moves to "Off" position as the changer automatically stops.

To Play Long-Play (33-1/3 RPM) Records.

1. Motor speed control knob must be in the 33-10"-12" position for 10" or 12" long play 33-1/3 RPM records, or in the 33-7" position for 7" long play 33-1/3 RPM records.

To Play Fine-Groove (45 RPM) Records.

1. Motor speed control knob must be in the 45 position for 7" fine groove 45 RPM records; however, these records are manufactured with a 1-1/2" spindle hole so it is essential that a record adapter be inserted into each 45 RPM record to be played. This is necessary to reduce the spindle hole to the conventional size.

REJECTING

To reject a record at any time while changer is operating, turn changer control knob to "Rej." and release.

STOPPING: To turn off changer before automatic shut-off, turn changer control knob to "Off". (NOTE: Do not stop changer during cycle.) Lift pickup arm and place on rest.

UNLOADING: Lift the record support and swing to left until pin on shaft drops into locating groove. Lift stack of records straight up off spindle.

MANUAL OPERATION

To play single records or home recordings, lift up the record support arm and move it to left, clear of the turntable. Place record on spindle and lower to spindle shelf. Tilt record down toward the rear of pickup arm and lower record to turntable. Turn changer control knob to "On" position, and trip index trigger on inside rear of pickup arm. Raise pickup arm and place the needle in lead-in groove of record.

REPEATING OF 7", 10" OR 12" RECORDS

To repeat, place record on the turntable, do not place the record support over the spindle, start changer. Record repeats until control is turned to "Off". If a 12" record is repeated, wait for the changer to finish cycling and re-position the pickup arm manually to the 12" position.

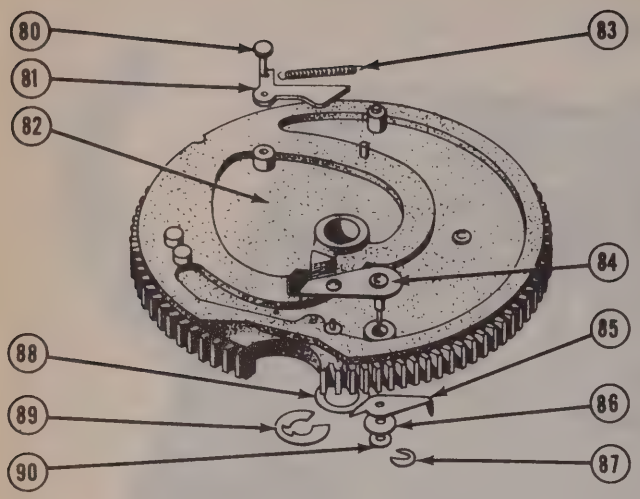


Fig. 3. Cam Assembly Top View

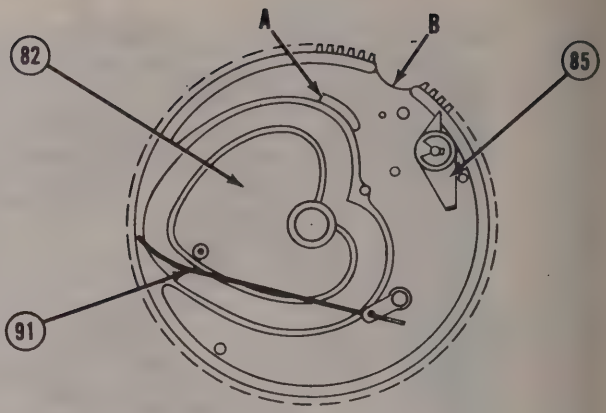


Fig. 4. Cam Assembly Bottom View

CAUTION

When changing needles, be certain that only a red-green cartridge is used, S-15780. This will accommodate 78, 45 and 33-1/3 RPM records.

DESCRIPTION OF CYCLING

The motor drives the turntable through the media of shafts and idler wheels. Moving (48) to REJ. position actuates control lever assembly (39). Reject rod (38) pushes trip pawl assembly (84) so that it engages the pinion gear on the bottom of the turntable, this causes the cam assembly (82) to rotate and starts the change cycle. Then guide channels in cam assembly (82) and roller (78) on lift arm assembly (79) act to swing lift arm assembly (79) so that one end lifts the roller spring assembly (27). This causes record pusher (23) to retract and push a record free to drop on the turntable.

At the same time the other end of lift arm assembly (79) swings and comes in contact with tone arm lift rod assembly (58). This lifts and returns the tone arm to a position over the tone arm rest. The operation of the reject mechanism (23) in the spindle (21) can be observed most easily if the changer is turned through a change cycle by hand. Operation of the tone arm set-down adjustments can be observed by raising the tone arm so the mechanism can be observed.

VELOCITY TRIP

This changer is provided with what is commonly known as a velocity trip rather than a ratchet and positive trip mechanism. A velocity trip depends, for the tripping action, on the rate of forward motion of the pickup arm with respect to the turntable rotation. The changer will trip only when the pickup arm advances more in one revolution of the turntable than the distance between normal grooves in a record. Only records having fast-finishing grooves before the eccentric cycling groove will operate the velocity trip. During the normal playing cycle, the trip pawl (84) is contacted with a wiping action by a small projection on the turntable hub. This repeated action prevents the trip pawl from engaging the projection while the pickup arm moves slowly toward the spindle.

A stud on the locator housing (56) contacts the trip link (75) when the pickup arm nears the end of a record. The end of the trip link nearest the spindle contacts the trip lever and turns it as the pick up arm advances. The trip lever, through spring washer tensio turns the trip pawl. Small motions of the trip pawl are not suf ficient to cycle the mechanism because, on each revolution of th turntable, the wiping contact by the hub projection moves the tri pawl back to clear the projection.

In the first revolution of the turntable, during which the picku arm advances rapidly, the trip pawl is moved far enough for th sharp point at the end to definitely engage the projection on th turntable hub, thereby turning the cam to start the change cycle

THEORY OF THE COBRA RADIONIC PICKUP

The operation of the Cobra pickup is considerably different fro Crystal and Dynamic pickups. These pickups generate audio pow er, while the Cobra controls power generated by a radio frequen cy oscillator, detector and audio amplifier. The oscillator oper ates at a frequency of 2.5 Mc. Modulation is accomplished b changing the energy losses in tuned circuit. These losses may b represented by an equivalent resistance in series with the reac tance of the coil. The ratio of the resistance to the reactanc determines the efficiency of Q of the coil. The amplitude of th RF voltage developed across this coil by an oscillator will var with changes in Q.

The grid coil L1 and other components of the oscillator ar mounted in the oscillator pre-amp chassis, while the plate co L2 is in the needle cartridge with the vane and needle assembly The coil is fixed and has 40 turns of No. 40 wire (approximate D resistance 2-1/2 ohms). The stainless steel vane, which is in th field of the coil, is spot welded to the osmium-iridium tippe stylus.

Any movement of the stylus will cause a corresponding moveme of the vane. As the stylus and vane follow the modulations in th record, changes in the mutual inductance between the vane ar coil occur (see Fig. 5). In position 2 the vane is at rest, and constant RF voltage appears across the plate coil. As the var is set in motion and reaches position 1, it is at its greatest ou ward swing from the coil, resulting in low mutual inductanc low reflected resistance, higher Q, and a higher RF voltage a ross the coil. In position 3 it is at its greatest inward swing; r sulting in a high mutual inductance, high reflected resistanc lower Q and a lower RF voltage. It can be seen that the ampl

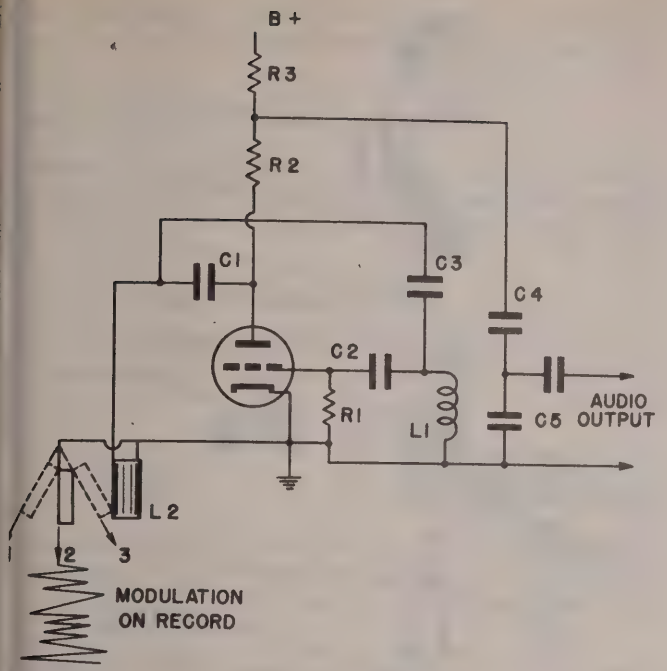


Fig. 5. Simplified Circuit of Oscillator.

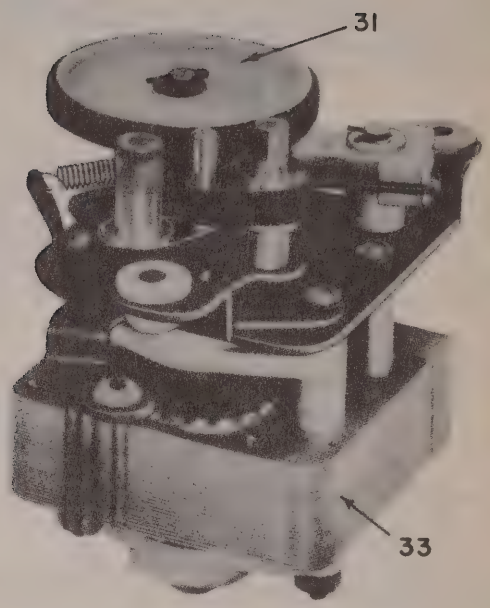


Fig. 6. Motor Drive Mechanism.

ude of the RF voltage which appears across the coil will vary with anges in Q, satisfying the condition for amplitude modulation. he position of the vane changes both the Q and L of the coil. hanges in L shift the frequency slightly, and a certain amount of equency modulation is present, but since there is no frequency scrimination it remains undetected.

nce the grid and plate coils are part of a single tuned circuit any ariations of amplitude of the RF voltage brought about by the anges in Q across the plate coil will also appear across the grid oil L1, causing a shift in the average plate current through the ate load resistor across which the audio output voltage is dev- oped. Plate bend detection takes place since only the positive alf of the grid swing causes an increase in the average plate cur- ent. These changes in the average plate current appear as audio oltage across the plate load resistor.

he 2.5 Mc RF voltage and the audio voltage both appear at the ate (pin 6) of the oscillator triode. R2, C4 and C5 filter out the F voltage allowing only the audio component to the grid (pin 4) the amplifier triode where it is amplified, fed through a shield- l lead to the audio amplifier of the receiver and reproduced by e loudspeaker.

MOTOR DRIVE MECHANISM

he 3-speed drive mechanism operates in a very simple manner. hen the speed control lever is turned to 78 RPM position, idler heel (31) is driven directly from the phono motor shaft. When e speed control lever is turned to 33-1/3 position, the entire ushing assembly is rotated in a counter-clockwise direction. his removes the phono motor shaft from the idler wheel and stead places the right hand 33-1/3 RPM speed reduction bush- g in contact with the idler wheel. The phono motor shaft through e media of a rubber drive belt then drives the 33-1/3 speed re- uction bushing which in turn drives the idler wheel. When the eed control lever is turned to 45 RPM position, the entire bush- g assembly turns clockwise. The 45 RPM speed reduction bush- g is then in contact with the idler wheel. The phono motor shaft rough the media of a rubber drive belt, then drives the 45 RPM eed reduction bushing, which in turn, drives the idler wheel.

LUBRICATION

Additional lubrication should not be required for the life of the changer, but in cases of unusual use, or high operating temperature, the changer should be lubricated as follows (refer to the exploded view):

Apply Lubriplate (Stay-Put Grease)

1. Hinge bearing (17)

2. Locator housing (56) and set-down locator plate (65).

3. Cam faces on lift arm (79), lift arm bearing and lift arm cut-off rod bearings.

4. Between lever spring (70) and cutoff rod (69).

5. Heart-shaped cam track on cam (82) and cam bearing.

6. Spindle between roller plunger and roller spring housing and the spindle body.

7. Turntable ball bearing.

8. Pickup arm locator assembly bearing (52) and ball bearing in pickup arm post.

9. Control lever bearing (39).

10. Turntable and spindle bearing.

ADJUSTMENTS

Needle Set-Down (refer to the exploded view).

The set-down position of the needle is adjusted by means of the two adjusting screws (8). If the needle is setting down too far out on the record, loosen the back screw about 1/4 turn and tighten the front screw to lock the adjustment in place. If the needle is setting down too far in on the record, loosen the front screw and

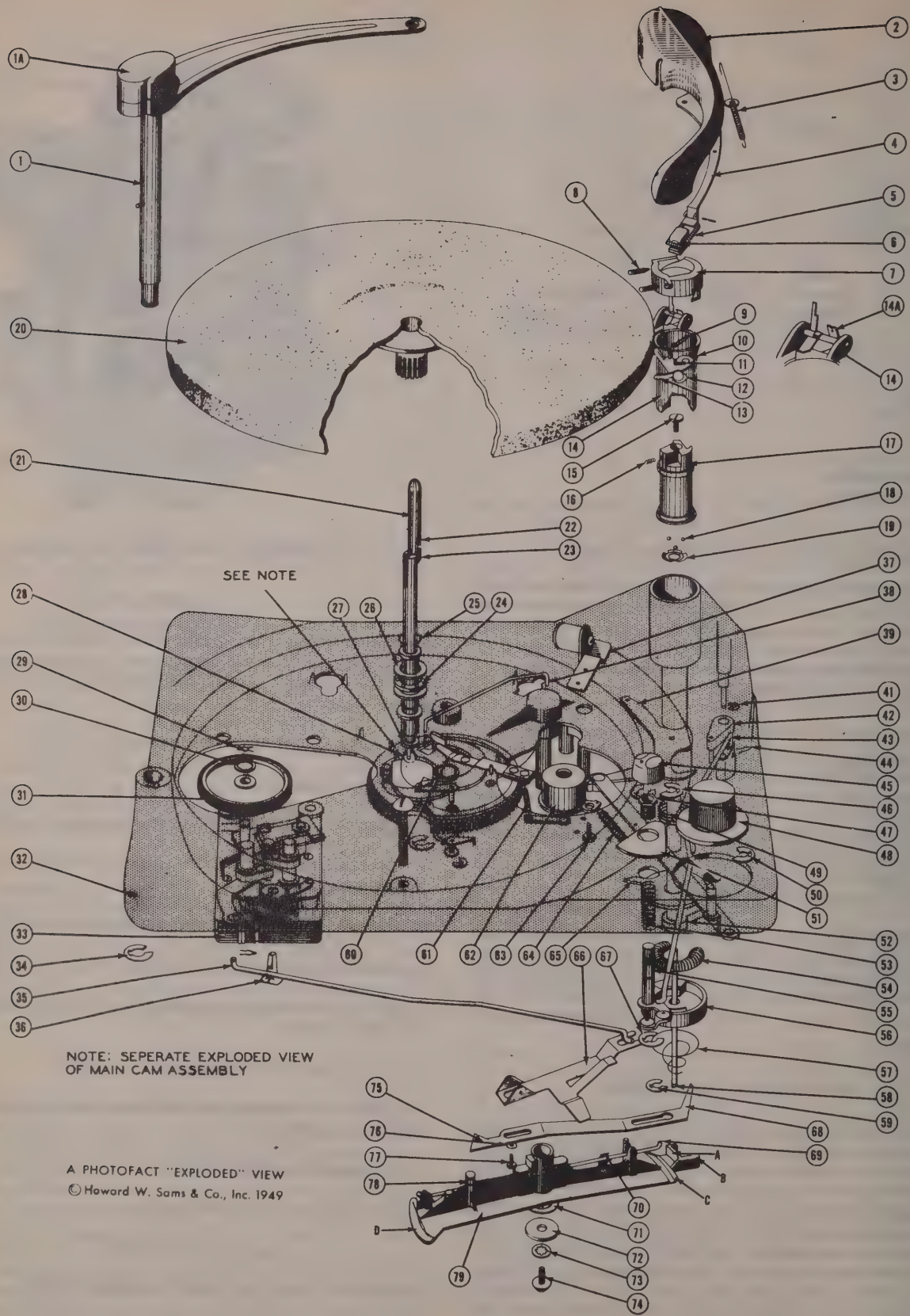


Fig. 7. Exploded View

tighten the back screw. When correct set-down is obtained for the 10" position, the 12" and the 7" needle set down will also be correct.

Pickup Arm Height (refer to the exploded view)

The pickup arm height is adjusted by the screw (15) located on top of the pickup arm lift rod (58). Turn the screw out or in until the underneath side of the pickup arm clears the rest by 1/8" to 3/16".

NEEDLE PRESSURE

The pickup arm needle pressure should be between 6 and 8 grams. If the pressure is in excess of 8 grams, the drilled end of the hinge bracket (14A) should be bent back away from the hinge bearing assembly (17). NOTE: A very slight bend of this bracket will cause considerable change in the pressure. If the pressure is less than 6 grams, correction may be made by bending the drilled end of the hinge bracket forward in the direction of the hinged bearing assembly.

In no case should the needle pressure be less than 6 grams. If this pressure is lower than 6 grams, the needle will not track in the record grooves, this may be recognized by "skidding" of the pickup arm across the record and by failure of the changer to cycle, at the end of the record. Improper tracking may be due to other causes (see heading "Needle Does Not Track Across Record Properly"). An accurate scale, calibrated in grams, must be used in checking this needle pressure.

TROUBLE SHOOTING

CONTROL KNOB (48) CANNOT BE TURNED TO "ON" POSITION.

1. Machine shut off during cycle.
   a. Turn the turntable clockwise, by hand, until the control knob (48) is free.

TURNTABLE (20) DOES NOT REVOLVE WHEN CONTROL KNOB (48) IS TURNED TO "ON" POSITION.

1. Machine stalled in cycle.
   a. Turn the turntable clockwise, by hand, until it starts rotating under its own power.

2. No current at motor (33).
   a. Check to determine if current is reaching A.C. leads of changer.
   b. Check the switch (62) to determine if it is closing.
   c. Check wiring and soldered terminals in the changer.

3. Motor (33) defective.
   a. Remove turntable to allow motor to operate without load. If current is reaching motor and pulley does not rotate, the motor is defective. Repair or replace.
4. Motor idler wheel (31) not engaging turntable rim.
   a. If motor pulley is turning but turntable is not:
      (1) Check motor idler assembly to determine if it is free to contact the motor pulley and the turntable.
      (2) Wipe off the inside rim on the turntable to remove flock, or if oily, clean the turntable rim and rubber tire of the idler wheel (31), shown in exploded view, with alcohol.
5. Oil on belts and pulley.
   a. Clean with alcohol.
   b. Replace belt and pulley.

CHANGER DOES NOT CYCLE WHEN THE CONTROL KNOB IS TURNED TO THE "REJ." POSITION (REFER TO EXPLODED VIEW).

1. The manual reject not actuating the trip.
   a. Turn the control knob (48) to the reject position, hold, and see if the reject link (38) on the control lever (39) is contacting the trip pawl (84) on the main cam (82). This should actuate the trip pawl (84) to engage with pinion gear on the turntable hub. When the trip rod (38) is pushed and the cam pawl (84) on the main gear figure (3) does not move forward, engaging the teeth on the turntable hub, check for binding between the cam pawl (84) and the cam. If binding occurs, clean out all foreign matter and check for freedom. Relubricate between cam pawl and cam with #DC4 Grease. Do not use an excessive amount.

ON MODELS S-14022 AND S-14024 CHANGER DOES NOT CYCLE WHEN REJECT BUTTON ON FRONT PANEL IS DEPRESSED.

1. Solenoid winding open.
   a. Solenoid winding open check with ohmmeter for continuity.

RECORD DOES NOT DROP WHEN CHANGER CYCLES (REFER TO FIGURE 2 AND EXPLODED VIEW).

1. Spindle pusher shaft broken.
   a. If the pusher shaft (inside the spindle) is broken, the roller assembly (28) will drop out of the spindle. Loosen the spindle holding set screws and remove the spindle assembly (21). Replace with a new spindle unit.

2. Pusher in spindle not moving far enough forward to eject a record.
   a. The pusher (23) should move up inside the spindle body, then move forward until it has reached a point flush with, or a maximum of .010" beyond the spindle body. To assure that the pusher is all the way forward, the spindle roller, part of the pusher and roller assembly (28), should be raised high enough by the lift arm (79), at the top of the cam face, to slightly compress the roller spring inside the pusher housing. (See "Turntable Stalls During Cycle.")

   If the roller is compressed and the pusher (23) does not move far enough forward to eject a record, the spindle should be replaced. If a record is not pushed completely off the ledge, it may hang up on the spindle momentarily, then drop on the pickup arm when it moves in over the turntable.

3. Lift screw loose.
   a. Check screw (74) to determine if it is turned all the way in.

4. Pusher raises outside spindle body.
   a. When the changer cycles, the pusher (23) should first rise inside the spindle body, then move forward inside the center hole in the record. If the pusher rises outside the spindle body, it will raise the record instead of pushing it off the spindle ledge. Remove the spindle and replace with a complete new spindle assembly.

5. Lift arm roller broken off.
   a. If the lift arm roller (78) is broken off, the lift arm (79)

will not turn when the cam revolves. Replace lift arm assembly (79).

TWO RECORDS DROP AT ONCE (REFER TO THE EXPLODED VIEW AND FIG. 1).

1. Hole in record too large.
   a. Check the diameter of the hole in the record. An oversized hole will cause two records to drop at once.

   Spindle slide not fully down.
   a. If spindle slide is not all the way down, more than one record may be dropped at a time.
   b. Check the spindle slide (22) to be sure it is free and does not bind at any point. Clean out foreign matter, or straighten if necessary. Do not oil.
   c. When records are placed on the spindle, be sure the spindle slide (22) is all the way down. The spindle slide (22) will normally raise slightly as a record is being dropped, but it should return to place immediately.

3. Record support binding on spindle, or bent out of square with the shaft.
   a. The record support (1) must be able to slide freely, by gravity, down the spindle, if the support does not follow the records down as they are being ejected. If binding occurs, two or more records may be ejected at once.
   b. Check the spindle (21) to determine if it is straight. If necessary, bend carefully with fingers.
   c. Straighten the record support (1) if it is not square with the record support shaft.
   d. If the hole in the record support (1) is not centered over the spindle after checking (b) and (c), bend the support shaft post on the baseplate until the hole in the record support is centered over the spindle.
   e. When the pin in the record support shaft has just entered the slot in the record support shaft post on the baseplate, the play in the record support as it is swung from one side to the other, should be equal on both sides of the spindle. To correct bent condition, hold the support shaft and carefully force the record support into the proper position. If the support is loose on the shaft, remove the knob and restake with hammer and punch.

4. Record pusher defective.
   a. The record pusher (23) may be deformed, etc. This may cause two records to drop at once. Replace with a new spindle assembly (21).

RECORD HITS PICKUP ARM (REFER TO THE EXPLODED VIEW).

1. Pusher in spindle not moving far enough to eject record.
   a. (See "Record Does Not Drop When Changer Cycles" -2)

2. Lift arm screw loose.
   a. Tighten lift arm screw (74).

3. Pusher extending beyond outside diameter of spindle.
   a. Replace spindle (21).

4. Pickup arm not adjusted properly.
   a. The adjustment procedure for the needle set-down point is given under "ADJUSTMENTS". If the hinge bearing (17) has been removed, or the hinge bearing set screw (16) has been loosened, the relationship between the hinge bearing and the pickup arm locator assembly (52) must be reset. To make the proper adjustments proceed as follows:
      (1) Allow changer to shut off automatically before removing tone arm.
      (2) Loosen the set screw (16) sufficiently to allow th hinge bearing to slide on the pickup arm locator as sembly shaft. The set screw may be adjusted wit an Allen wrench through the hole in the adjusting rin (7) located between the two adjusting screws (8)
      (3) Place a 1/32" shim or .032 dia. music wire betwee the set-down locator (65) and the locator housin (56).
      The shim or music wire must clear detents on (65 and (56).
      (4) Raise the pickup arm and rotate the hinge assembl counter-clockwise as far as it will go. In this posi tion, the arm extending from the set-down locato should be engaged by the turned-down leg on the con trol lever (39).
      (5) Take up all the play between the parts and shim b pressing up on the bottom of the locator housing an down on the top of the hinge bearing. Align detent on (65) (56).
      (6) Tighten the hinge body set screw (16) and remove th shim.

NEEDLE DOES NOT SET DOWN ON 10" RECORD IN PROPE POSITION (REFER TO THE EXPLODED VIEW).

1. Pickup arm not adjusted properly.
   a. (See "Record Hits Pickup Arm" - 4)

2. Hinge catch (10) does not return to 10" record position whe changer cycles.
   a. Stop the machine in mid-cycle when the lift arm (79) ha moved as far out as it will go and is about to move back t its starting position. Lift the pickup arm and see if ther is a gap of at least 1/64" between the end of the leg on th catch (10) and outside step on the adjusting ring (7). Th catch should be free to allow it to be pulled forward agains the stop at the end of the leg on the adjusting ring. If ther is not enough gap, check the setting of the hinge body an the pickup arm locator. (See "Record Hits Pickup Arm -4). If the setting is incorrect, the cam face on the lif arm (79), which contacts the round stud on the bottom o the locator housing (56), may be bent. The locator housin should be forced around far enough to bring the pickup arn out until the stop on the bottom of the hinge casting meet the stop in the baseplate; then, to assure that the picku arm is out as far as it will go, the lift arm should mov the locator housing a few degrees farther around, whic will slightly compress the safety spring (54) and hold th pickup arm out firmly against the stop.

   b. Lubricate the hinge bearing with Stay-Put Grease. Do no use heavy grease. If the bearing between the hinge bear ing and hinge body binds, the safety spring will compres instead of bringing the hinge body around firmly agains the stop.

3. Binding between safety spring and locator housing.
   a. If the safety spring (54) binds against the locator housin and does not hold the casting on the bottom of the picku arm locator assembly (52) against the stop inside the loca tor housing, irregular needle set down will result. Dis assemble the pickup arm locator assembly (52) by remov ing the lift arm (79) loosening the hinge bearing set screw (16), and pulling the locator housing and pickup arm locato assemblies down from the bottom of the changer. Hold th pickup arm locator shaft in one hand, turn the locato housing assembly to slightly compress the safety sprin release, and see if the safety spring returns the picku locator casting firmly against the stop surface of the lo cator housing assembly. If binding occurs, remove th

safety spring to see if the pickup arm locator casting turns freely in the locator housing casting. Remove burrs or sharp edge on end of safety spring, stretch safety spring a little to increase tension, and replace.

b. Check to see if the locator plate (65) is meshing with the locator housing when the lift rod (58) is positioned at the beginning of the sloping cam surface (C) of the lift arm (79) in the final stage of the cycle. To test the meshing of the locator plate and the locator housing, swing the pickup arm half way in toward the spindle. If the locator plate and locator housing disengage when in the above position, it is necessary to reset the clearance between the locator plate and the locator housing. (See "Record Hits Pickup Arm"). Also, it may be necessary to file off any burrs which may be present on the mating surfaces of the locator plate and the locator housing.

Hinge catch does not disengage from the hinge cam.

a. When the index lever (13) has been depressed, it is held in the position until the catch (10) is disengaged. (See "Needle Does Not Set Down on 12" Record in Proper Position" -6). When the cycle is completed, if the catch does not disengage from the hinge cam (11):
   (1) Check to determine if the leg on the catch (10) is sliding down the incline on the left of the adjusting ring (7).
   (2) The catch (10) and the hinge cam (11) are not disengaging when the catch leg is resting on the inside step on the adjusting ring. If this occurs, file the edge of the catch which contacts the hinge cam until the two parts have a clearance between them of about 1/64" when the leg on the catch is on the inside step on the adjusting ring.

Tone arm will not set down on record after the changer has shut off automatically.

a. The long tail of locator plate (65) may be bent, straighten with pliers.

)LE DOES NOT SET DOWN ON 12" RECORD IN PROPER TION (REFER TO THE EXPLODED VIEW).

Diameter of 12" record undersize.

a. The set-down position of the needle for 12" records is determined by the edge of the record striking the index lever (13). If a 12" record has a diameter of less than the standard size of 11 7/8", plus or minus 1/32", it may fail to depress the trip lever far enough.

Enlarged center hole in record.

a. An enlarged center hole might fail to set the trip lever because it could produce the same effect as a small record.

Pickup arm not adjusted properly.

a. (See "Record Hits Pickup Arm" -4.)

Binding between safety spring and locator housing.

a. (See "Needle Does Not Set Down on 10" Record in Proper Position" -3).

Index lever does not cock when 12" record drops.

a. Allow a 12" record to drop to the turntable and stop the changer just after it falls, before the pickup arm has a chance to move in over the record. The index lever should be forced down until the step on the hinge cam (11) passes the edge of the catch (10), preventing the hinge cam and the index lever from returning to their original position. If the trip lever does not stay down in a depressed position:
   (1) Check the catch (10) to see if it is free to move forward and engage the hinge cam.
   (2) If the stop on the bottom of the hinge body (14) is bent, it might allow the pickup arm to move too far out, thus moving the index finger away from the spindle. This would produce the same effect as an undersize record. Item 14 should then be replaced.

6. Hinge catch does not go into inside step on adjusting ring when index lever is depressed.
   a. When the index lever (13) is tripped by a falling 12" record, the leg on the catch (10) should be moved out over the incline between the inside and outside steps on the adjusting ring leg and held in that position by the shoulder on the hinge cam (11) until the pickup arm starts to move in over the record. When this occurs, the leg on the catch should contact the incline and be moved out as it slides down the incline until the catch (10) is disengaged and the index lever (13) can snap back up to a horizontal position. If the leg on the catch is not moved out far enough to enable it to slide down incline, file about a 1/64" chamfer on the edge of the catch leg (10) which contacts the incline. Check for binding between hinge body (14) and hinge bearing (17). Burrs on the bearing surfaces or lack of lubrication may prevent the hinge bearing from turning freely.

NEEDLE DOES NOT TRACK ACROSS RECORD PROPERLY.

1. Needle may be clogged by accumulation of lint, dirt, etc., or sapphire tip may be chipped.
   a. Clean foreign material from around needle.
   b. Check needle to see if the tip is bent or broken. Replace needle.

2. Locator housing does not disengage from the set-down locator when a cycle is completed.
   a. There should be a 1/32" gap between the locator housing and the set-down locator when the machine is not in cycle. If the gap is small enough to allow the parts to touch and bind as the needle moves across the record, the hinge bearing must be reset. (See "Record Hits Pickup Arm" -4.)

3. Hinge bearing binds.
   a. Place a block under the back end of the pickup arm to prevent the needle from touching the turntable. With sensitive gram scale, check the amount of force required to move the pickup arm across the turntable. The force required should not exceed 3 grams. If the pressure required is excessive:
      (1) Check the locator housing and set-down locator for binding. (See 2, above.)
      (2) Check the bearings (18) in the pickup arm post for binding. The bearing is located below the hinge bearing (17). To inspect it, loosen the set screw (16) in the hinge bearing. Unsolder the pickup leads and pull them out. Pull up on the hinge and pickup assemblies. Clean foreign matter or corrosion from the bearings; (18) lubricate with light mineral oil. (To reset position, see "Record Hits Pickup Arm" -4.)

4. Changer not level.
   a. (See "Leveling Record Changer During Long Play" under "General")

5. Excessive vibration while playing an LP record.
   a. Any vibration caused by (1) unsteady mounting, (2) floor vibration, or (3) passing of heavy vehicles may cause the pickup to glide across the record grooves.

CHANGER TRIPS BEFORE NEEDLE REACHES END OF RECORD.

1. Hole in record too large.

a. If the hole in record is too large, the groove may turn eccentric with the spindle and cause premature tripping.

2. Binding of trip link.
   a. With the trip link (75) released, check the trip link for freedom of motion. It should be free to move without binding.

CHANGER DOES NOT CYCLE WHEN RECORD HAS BEEN PLAYED.

1. No eccentric trip or fast spiralled groove on record.
   a. All standard records made today have a finishing groove, but some records made in the past did not have this groove. When records of this type are being played, the control knob must be turned to "Rej." at the end of the record.

2. Needle jumps out of grooves in record.
   a. Check trip pressure -- the lateral friction of tone arm should not exceed 3 grams. (If the pressure is excessive, see "Changer Trips Before Needle Reaches End of Record." and "Needle Does Not Track Across Record Properly.") Suspend the pickup approximately 2" to 5" above the record changer.
   Using a gram scale, measure the amount of horizontal pull on the pickup arm after the arm has become engaged with the locator trip assembly.
   b. The record may be defective. The finishing groove is often too shallow. Check with a record which is known to be good.
   c. The needle point may be damaged or affected by an excessive accumulation of dust, lint, etc. Check needle pressure as described under "Adjustments."
   d. There may be binding in the pickup bearing or locator housing. (See 1 and 2 -- "Needle Does Not Track Across Record Properly.")

3. Trip pawl binding on cam face.
   a. The trip pawl (84) must be free to move forward and engage the teeth of the turntable hub when the trip link (75) pushes it. Do not oil. To be lubricated with DC-4 grease. (See "Changer Does Not Cycle When the Control Knob is Turned to "Rej." Position.")

TONE ARM HITS RECORDS ON SPINDLE WHEN IT RAISES, OR HITS TONE ARM REST WHEN ARM MOVES OUT;

1. Tone arm height not adjusted properly.
   a. (See instructions for adjusting the tone arm height under "Adjustments.")

TURNTABLE SPEED TOO SLOW (REFER TO THE EXPLODED VIEW).

1. Binding in turntable bearing.
   a. Check the turntable bearing for freedom. Hold the motor idler wheel (31) out of engagement with the turntable and spin the turntable, by hand, to see if it turns readily and coasts for a long time. If binding occurs; remove turntable, foreign matter, and lubricate with light mineral oil.

2. Motor bearings bind.
   a. Lubricate with oil.

3. Line voltage too low.
   a. The line voltage should not be less than 105 volts or the turntable may turn too slowly.

4. Operating temperature too low.
   a. If the machine has been stored in a cold place, or ope
   ted in surroundings at a temperature of less than 60°
   the turntable speed may be too slow.

TURNTABLE STALLS DURING CYCLE (REFER TO THE
PLODED VIEW).

1. Motor idler not engaging turntable.
   a. (See "Turntable Does Not Revolve When Control Kno
   Turned to 'On Position' " --4).

2. Turntable bearing tight.
   a. (See "Turntable Does Not Revolve When Control Kno
   Turned to 'On' Position" --5.)

3. Operating temperature too low.
   a. (See "Turntable Speed Too Slow" --4.)

4. Line voltage too low.
   a. The line voltage should not be less than 105 volts.

5. Binding in drive mechanism.
   a. Remove lift arm (79) and hold idler (31) away from tu
   table, or remove idler wheel. Cycle machine, turn
   turntable slowly, by hand. The cam should turn freely
   the complete revolution without binding at any point
   binding occurs, check for foreign matter in the gear te
   a bent cam bearing or bent spindle bushing.
   b. Replace lift arm, loosen spindle set screw and raise sp
   dle high enough to clear the lift arm cam when the ma
   ine cycles. Hold the tone arm lift rod (58) up so the en
   the lift rod does not contact the lift arm cam. Cycle
   machine by hand. The entire cycle should be free with
   binding at any point. If binding occurs, check the lift a
   bearing for freedom, and the lift arm roller to be sur
   is not bent causing binding in the cam track.

6. Binding between tone arm lift rod and lift arm cam fa
   a. Cycle machine, stopping it half way through the cycle
   as the lift arm is about to return. Lift tone arm and ra
   lift rod (58) by pulling up on the adjusting screw (15)
   high as it will go. Feel the lift arm (79) for play. The
   rod may still touch the lift arm cam face, but it should
   bind. If binding occurs, the lift arm bearing may be b
   or the fiber washer (71) under the lift arm should be
   moved to lower the lift arm.

7. Spindle roller spring compressed too far.
   a. Cycle the changer and watch the relationship between
   bottom of the pusher housing (part of pusher and roller
   sembly) (27), and the roller (28). Just before the top of
   lift arm cam is reached, the pusher housing should s
   its upward motion and the roller should continue up .0
   to .047" more, slightly compressing the roller spring.
   the spring compresses too much, the changer may stall
   the shut-off cycle:
   (1) If the roller spring is being compressed too much,
   move the fiber washer (71) between the lift arm and
   steel washer.

8. Motor weak.
   a. In cases where everything checks all right, but the chan
   still stalls in cycle, the motor may be weak. Repl
   motor.

CHANGER CONTINUES TO CYCLE.

1. Reject spring (64) loose.
   a. Make certain that the reject spring (64) is secured in pc
   tion at both ends.

Locator spring (83) loose.
Check the cam locator spring (83) to make certain it has not fallen off or has become unfastened at either end.

Reject rod (38) frozen.
a.Make certain that the reject rod (38) is not frozen in the reject position.

Trip pawl (84) binding.
aCheck the trip pawl (84) on the main cam (82) figure -- to make certain it does not bind and that it is free of all foreign matter. (See "Changer Does Not Cycle When The Control Knob is Turned to 'Rej.' Position.")

E DURING PLAYING OF RECORD.

Rumble from motor.
a.If a low-pitched rumbling sound comes from the loud speaker while a record is being played, check the motor grommets to be sure the motor is freely suspended on them. The motor lead wires should have slack to allow the motor to float.

Defective turntable bearings.
aDefective turntable bearings (24) can cause rumble. Check for foreign matter in the bearings, defective balls, binding between balls and ball retainer; rough surface on washers. Clean ball bearings, sleeve bearing and washers. lubricate with lubriplate or light mineral oil.

Defective motor idler wheel (31).
aA rapid thumping sound, while the motor is running, may indicate a flat spot on the motor idler wheel (31). If this condition does not clear up after ten minutes of running time, remove the turntable and check the rubber tire on the idler wheel. If the surface of the rubber tire is not smooth and even, replace the idler. Should the bearing of the idler wheel show signs of excessive wear, or be extremely wobbly, the idler wheel should be replaced.

Defective record.
a.Worn or defective records cause needle scratch and distortion of the recorded sound. If the record is warped, it may slip on the other records causing "Wow," a waver in the recorded sound. An enlarged hole in the record can also cause "Wow."

Turntable scrapes.
aIf a scraping sound occurs as the turntable revolves, check:
(1) Turntable warped, causing turntable to rise and fall.
(2) Motor idler or mounting plate bent.
(3) Wires beneath turntable rubbing.

Squeaks.
aSqueaking sound as changer operates indicates lack of oil. Lubricate points indicated under "Lubrication" - thin layer of vasoline on spindle.

ORTION OF RECORDED SOUND.

Defective record.
a(See 3 -- "Noise During Playing of Record.")

Defective phono-oscillator.
aCheck phono-oscillator, amplifier, and speaker.

Bad cartridge.
a.Replace.

NO SOUND DURING PLAYING.

1. Defective cartridge.
   aReplace.

2. Defective amplifier.
   a.Check phonograph amplifier and speaker.

EXCESSIVE RECORD WEAR.

1. Binding in tone arm.
   a.(See 1 and 2 -- "Needle Does Not Track Across Record properly.")

CHANGER DOES NOT SHUT OFF AFTER LAST RECORD HAS BEEN PLAYED (REFER TO THE EXPLODED VIEW).

1. Record support binding on spindle.
   a.The record support (1) must rest on the offset shoulder of the spindle or the changer will not shut off. (See 3 -- "Two Records Drop at Once.")

2. Cut-off rod (69) not engaging shoulder pusher housing.
   a.On the shut-off cycle, the end of the cut-off rod (69) should contact the shoulder on the bottom of the spindle pusher housing, part of the pusher and roller assembly (27) and turn the cut-off rod over 90°. If the end of the cut-off rod passes under the pusher housing as the machine cycles on the shut-off cycle, check:
   (1) The record support to be sure it is resting on the spindle. (See 1, above.)
   (2) The spindle to see if it is being held in place by the spindle set screws.
   (3) The lift arm screw (74) to be sure it is tight.

CHANGER SHUTS OFF PREMATURELY (REFER TO THE EXPLODED VIEW).

1. Spindle roller spring compressed too far.
   a(See 7 -- "Turntable Stalls During Cycle.")

2. Roller spring in spindle too weak.
   a.When the bottom record of a stack of ten 12" records is being ejected from the spindle ledge, the roller spring (in the housing) should not compress until just before the roller reaches the top of the cam incline on the lift arm. If the roller spring is compressed under the load of a full stack of records, it may cause premature shut-off. Replace with a complete spindle assembly (21).
3. Record too thick.
   The changer is designed to play standard records. If an old-style 1/8" thick record is used, the changer will shut off instead of dropping the record.

4. Cut-off rod not being reset.
   a.After the shut-off cycle, when the cut-off rod (69) has been turned to throw the switch to the "Off" position, it should be returned to its original position, the next time the machine cycles, by the bent-up end of the cut-off rod contacting the round stud on one leg of the control lever (39). The flat spring (70) acting against the cut-off rod should throw the rod against its stop on the lift arm (79) and hold it there. If the cut-off rod is not fully turned, the bent-up end next to the spindle may stick up high enough to prematurely contact the shoulder on the pusher housing, part of pusher and roller assembly (27).
   (1) Check the lever spring (70) for tension. Remove and

bend slightly to increase tension if necessary.

(2) Lubricate the cut-off rod bearings, and around the lever spring, with Stayput grease or light mineral oil.

(3) Check the clearance between the end of the cut-off rod (69) which passes under the control lever. When the cut-off rod is in its normal operating position, it should not clear the bottom of the round stud by more than enough to completely turn the end of the cut-off rod vertical position back to a horizontal position.

TURNTABLE CONTINUES TO ROTATE WHEN CONTROL KN
IS TURNED TO "OFF" POSITION.

1. Switch defective.
   a. Check switch for defect and replace if necessary.

NEEDLE DOES NOT SET DOWN ON 7" RECORD IN PROPE
POSITION.

1. Tail on set-down location plate (65) damaged or bent out
   position.
   a. Straighten or replace.

PARTS LIST FOR S-14022, S-14024, S-14025 and S-14027

1-VM1799N	Record Support Assem. (Complete)	2.40
1A-VM1711K	Knob (Used on VM1799N)	.45
2-148-117	Tone Arm Shell (Only)	1.25
4-VM3093	Socket & Strengthener Assem.	1.00
7-VM1840	Adjusting Ring Assem.	1.60
8-VM1580	Adjusting Screw (2 used)	.20
14-VM2043	Complete Hinge Assem.	6.60
15-VM1616B	Set-Down Height Adjusting Screw	.04
16-VM1610	Set Screw	.20
17-VM1512	Hinge Bearing	2.00
18-VM724	Ball Bearing 1/8" Dia. (6 used)	.03
19-VM3059	Bearing Spacer (for VM724 Bearings)	.05
20-VM2885A	Turntable Assem. (Complete)	6.75
21-VM3114	Spindle & Bearing Assem. (Complete)	13.50
24-VM2624	Bearing	.75
25-VM2078	Retaining Ring	.04
26-VM2639	Turntable Washer	.30
29-21914	Hairpin Clip	.01
30-21844	Fiber Wheel	.01
31-61-125	Idler Wheel	.75
32-VM3092	Base Plate Assem.	12.00
33-VM2727C	Phono Motor Only	17.50
34-VM2110	"C" Washer for VM1799N	.03
35-VM2823	Index Rod	.20
36-VM1685	Motor Fasteners (3 used)	.10
**37-S-13913	Solenoid Assem.	.65
38-VM2764	Reject Rod	.20
39-VM2425	Control Lever Assem. (Complete)	3.00
41-VM1588	"C" Washer	.04
42-VM1581	Index Cam	.25
43-VM2643	Index Lever	.25
44-VM2661	Hairpin Clip	.03
45-VM2198K	Speed Knob	.60
47-VM2354	Speed Control Shaft Bearing	.20
48-VM2054K	Reject - On-Off Knob (Control Knob)	.70
49-VM1631	Locator Spring	.10
50-VM1652	"C" Washer for Control Crank	.04
51-VM3091	Speed Escutcheon	.60
52-VM1522	Set Down Locator Assem.	1.35
54-VM1638	Safety Spring (used on VM1522)	.10
55-VM2824	Speed Control Crank	.40
56-VM2891	Locator Housing & Lift Rod Assem.	2.80
57-VM1620	Conical Spring (used on VM1513)	.03
58-VM1513	Lift Rod Assem.	.45
59-VM1650	"C" Washer (Lift Rod)	.03
*x 60-VM3016	Armature Brkt. Assem.	.20
** 61-VM3006	Armature Return Spring	.20
62-VM1519	A.C. Switch (Only)	1.35
64-VM1721	Reject Spring	.10
65-VM2648	Set Down Locator Plate	.20
66-VM3240	Shut Off Brkt.	.15
69-VM1595	Cut-off Rod	.25
70-VM1599	Cut-off Rod Tension Spring	.0
71-VM1637	Fiber Washer (1/64" thick)	.0
72-VM1922	Fiber Washer (3/64" thick)	.0
75-VM2790	Trip Link	.1
77-VM2275	#4x 1/2" Hex Screw	.0
79-VM2887	Lift Arm Assem. (Complete)	3.0
81-VM2789	Cam Locator	.2
82-VM2796	Cam Gear Assem.	3.1
83-VM 419	Spring (Cam Assem.)	.2
84-VM2795	Trip Pawl Assem.	.7
85-VM2760	Trip Lever	.2
86-VM2516	Spring Washer	.0
87-VM1588	"C" Washer	.0
88-VM1653	Fiber Washer	.0
89-VM1651	"C" Washer for Main Cam	.0
90-VM2829	Fiber Washer	.0
91-VM2388	Wire Spring (Cam Assem.)	.1
15-79	Cap & Insulator	.0
58-75	Connector Plug	.0
58-86	2-Prong Plug	.1
58-133	9-Prong Plug	.1
58-166	6-Prong Plug	
S-15780	Red & Green Cobra Cartridge	3.5
VM3014	Complete Tone Arm & Hinge Assem. (Less Cartridge)	6.4
VM2881	Hinge & Brkt. Assem.	3.7
VM2310	Pivot Screw (2 used)	.1
VM1737	A.C. Switch Cover	.2
VM2765	Rubber Grommet (2 used)	.0
VM2792	Trip Link Support	.0
VM3015K	Tone Arm Rest.	.3
VM3174	A.C. Switch & Cable Assem.	4.0
63-1778	680 Ohm 1/2W Ins. Res.	.2
32-26	Drive Belt (2 used)	.2
22-1914	.047 Mfd (Molded) 400 V	.3
112-619	#2x5/16" R.H. S.T. Screw (3 used)	.0
VM1574	Adjusting Ring Spring	.2
VM1596	Cut-off Rod Retaining Pin (2 used)	.0
VM1547	Drive Pin Came Assem.	.0
VM-1687	Spring Guide	.0

* Denotes Parts Used on S-14024 only.

** Denotes Parts Used on S-14024 & S-14022 Only.

x Denotes Parts Used on S-14025 & S-14027 Only.

Parts not marked as above, are common to all changers.

All Prices shown are suggested list prices and subject to change without notice.

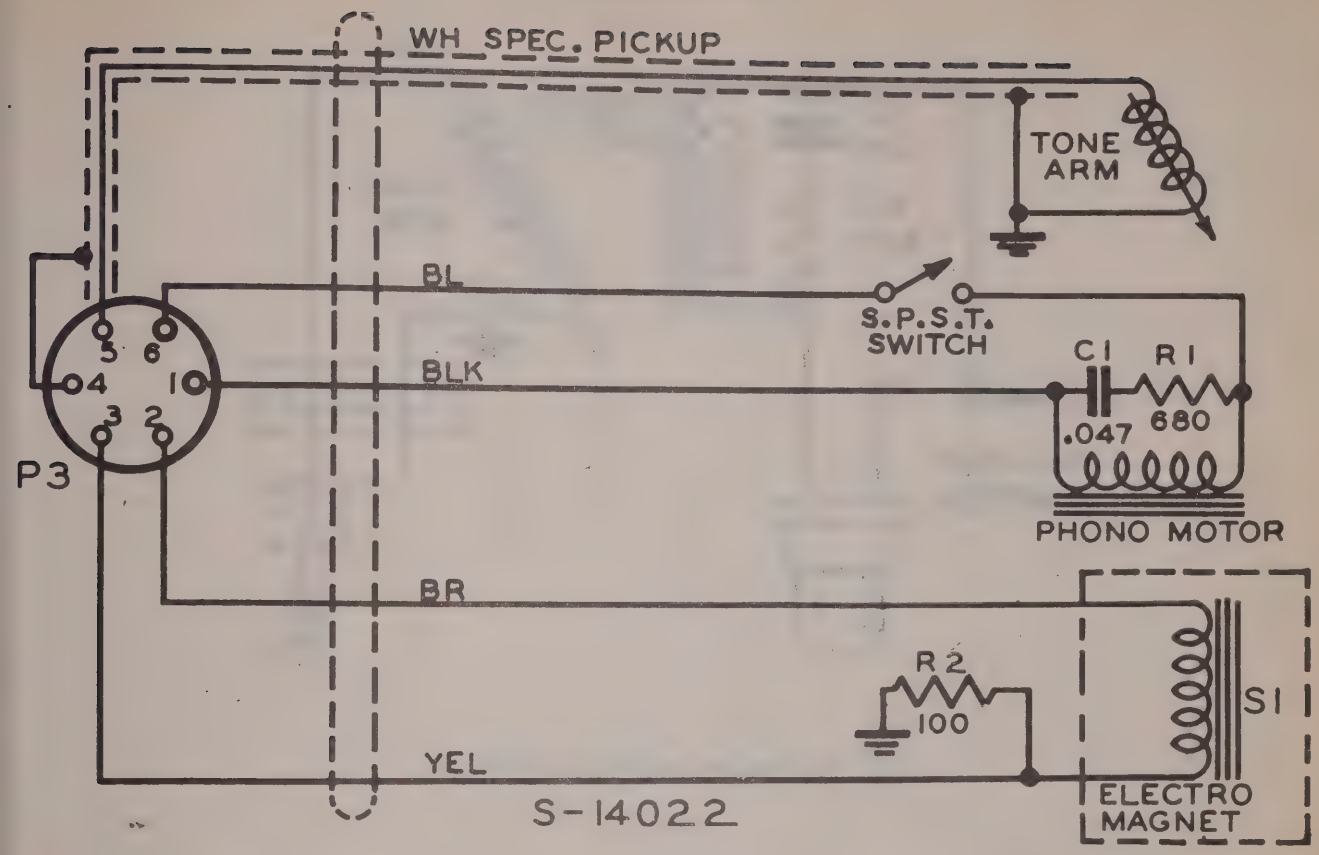


Fig. 8. Electrical Schematic, S-14022

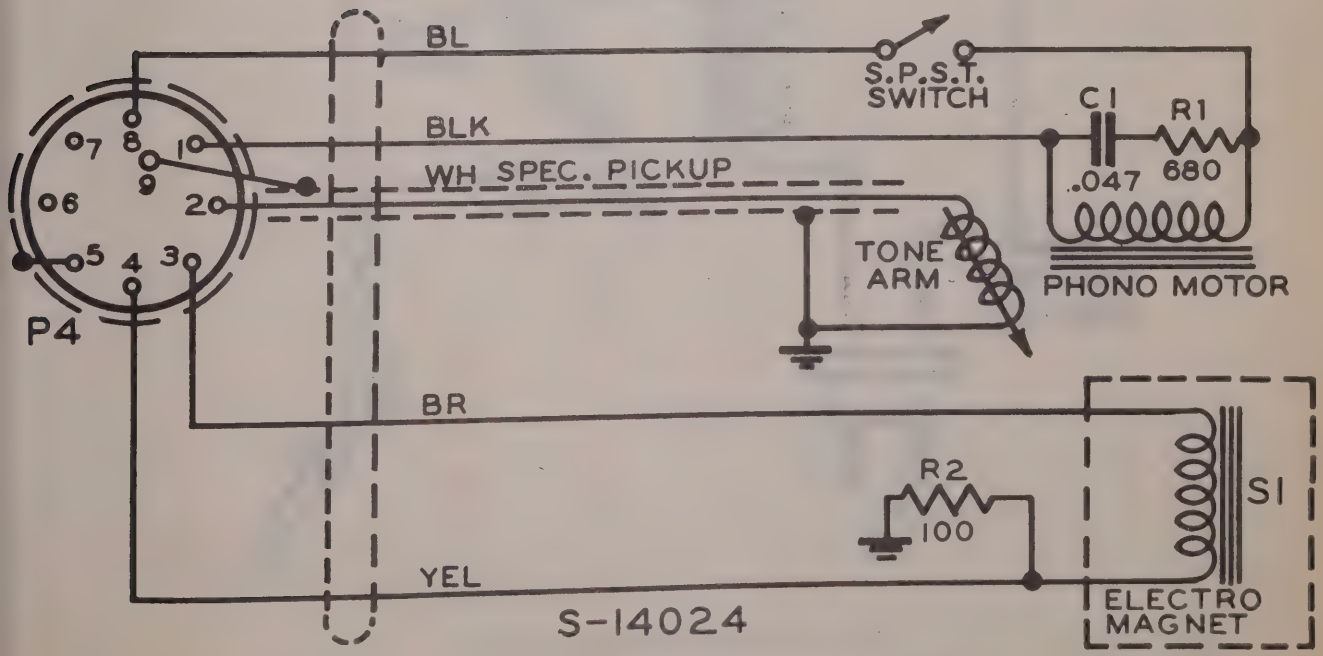


Fig. 9. Electrical Schematic, S-14024

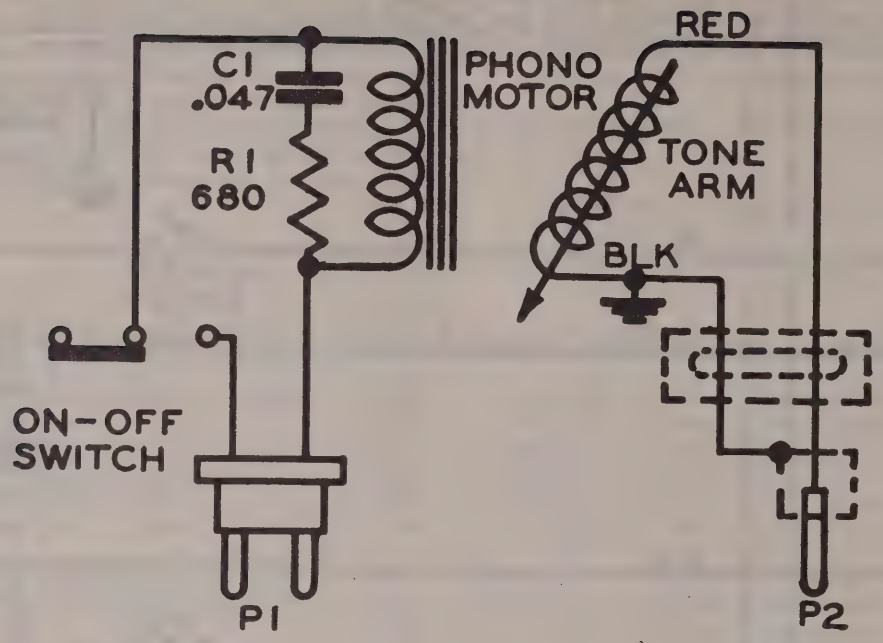


Fig. 10. Electrical Schematic, S 14025

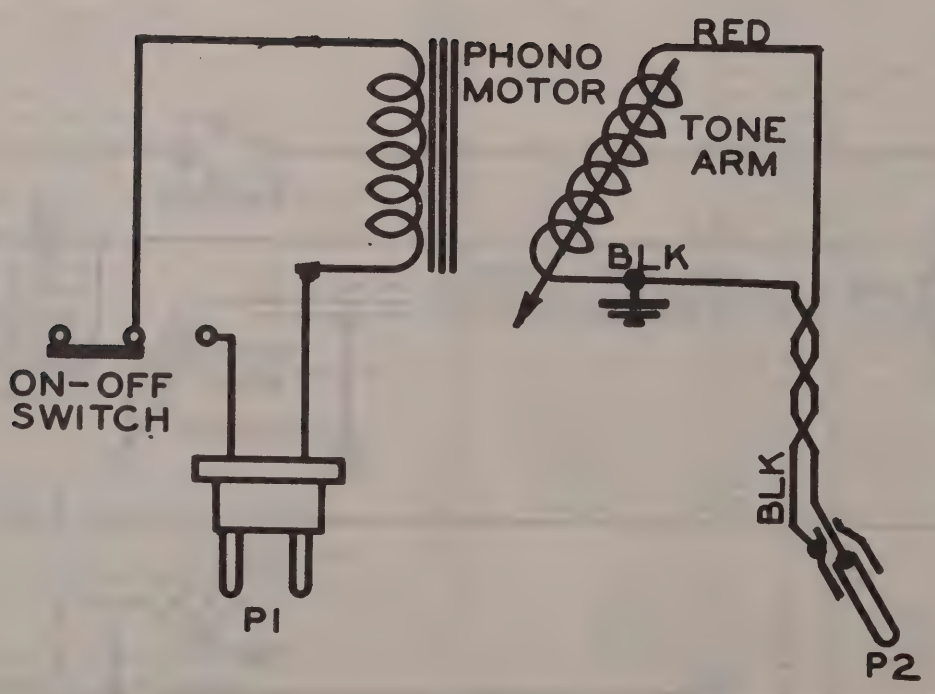
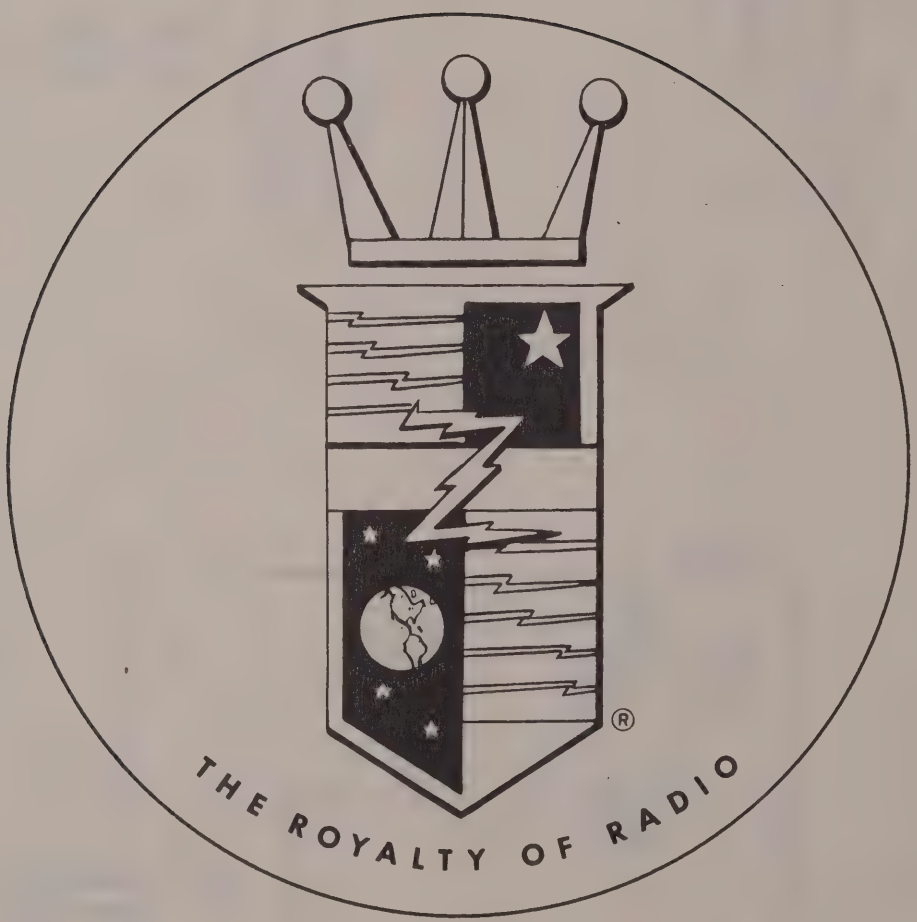


Fig. 11. Electrical Schematic, S-14027

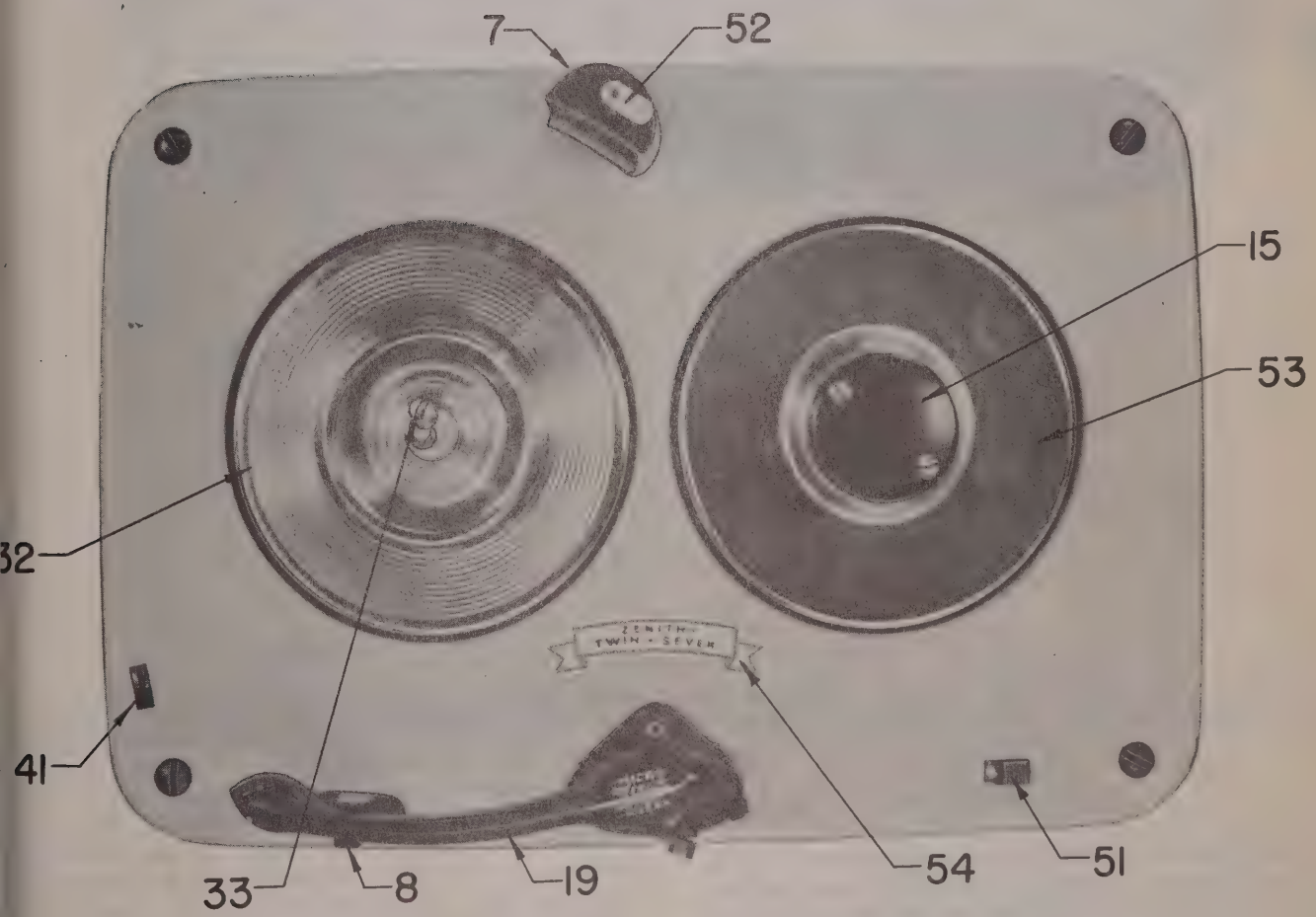
MEMO


THE ROYALTY OF RADIO

ZENITH

REG U S PAT OFF

SERVICE MANUAL



AUTOMATIC RECORD CHANGERS
MODELS S14023 and S14026

ZENITH RADIO CORPORATION
6001 DICKENS AVENUE • CHICAGO 39, ILLINOIS

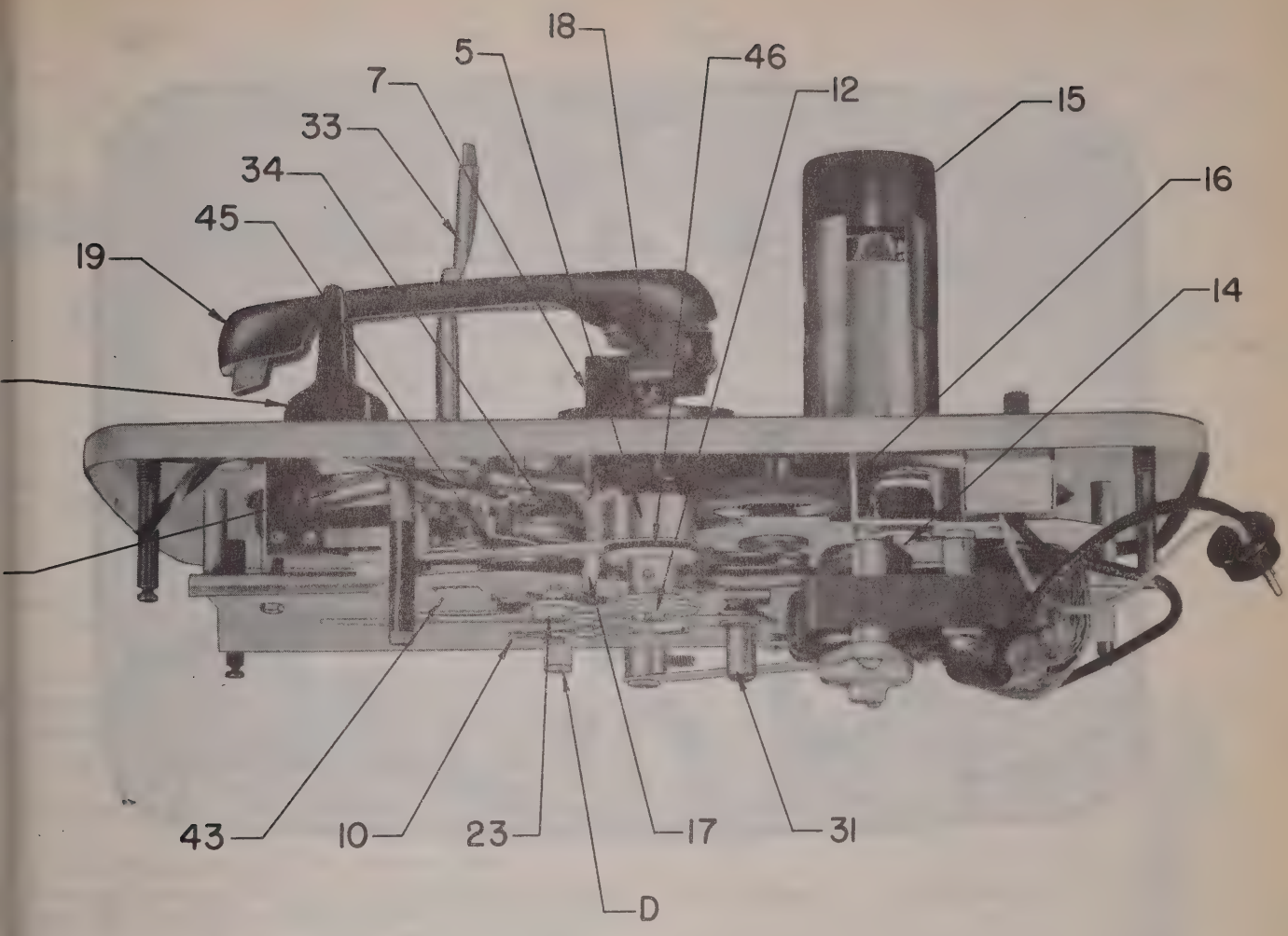


Fig. 2 Side View

GENERAL

ıe Zenith Model S14023 and S14026 Record Changers are signed to automatically play 7" 33 1/3 RPM and 7" 45 'M Micro Groove records. With a few minor exceptions, these two changers are alike both electrically and echanically. The only actual difference between the two angers is in the AC power cable to the record changer d the connecting cable from the Cobra Tone Arm to the ono pre-amp. These changers will play either a stack twelve 7" 33 1/3 RPM records or twelve 7" 45 RPM cords. However, these records cannot be played multaneously and neither can they be intermixed. ıese changers employ two turntables, one rotating at 45 'M and the other rotating at 33 1/3 RPM. There is but single tone arm and this is to be used for either turnıle. To move it from the 33 1/3 RPM playing position the 45 RPM turntable playing position, all that is reired is to grasp it and lift it high enough to clear the 1/3 RPM spindle then swing it to the right until it aps into the 45 RPM playing position. Thus indexed, is ready for 45 RPM operation. These changers do not rn off after the last record has been played. They will peat the final record until the record player is turned off manually. Connect this changer only to an outlet supplying 117 volts 60 cycle. Power consumption is 25 watts.

SHIPPING BOLTS

Before placing the record changer in operation, the machine must be floated freely on the mounting springs. During shipping the mechanism is secured by means of four shipping bolts. To float the changer, use a wide blade screw driver and turn the four mounting bolts clockwise until the heads are flush with the mounting plate which allows the changer to float on its shock mounts. (See Fig. 1)

LEVELLING THE RECORD CHANGER

It is essential to have the changer absolutely level. Use a torpedo or similar type level on the record changer base plate, use adequate shims to level the record changer pan or combination cabinet to achieve perfect level.

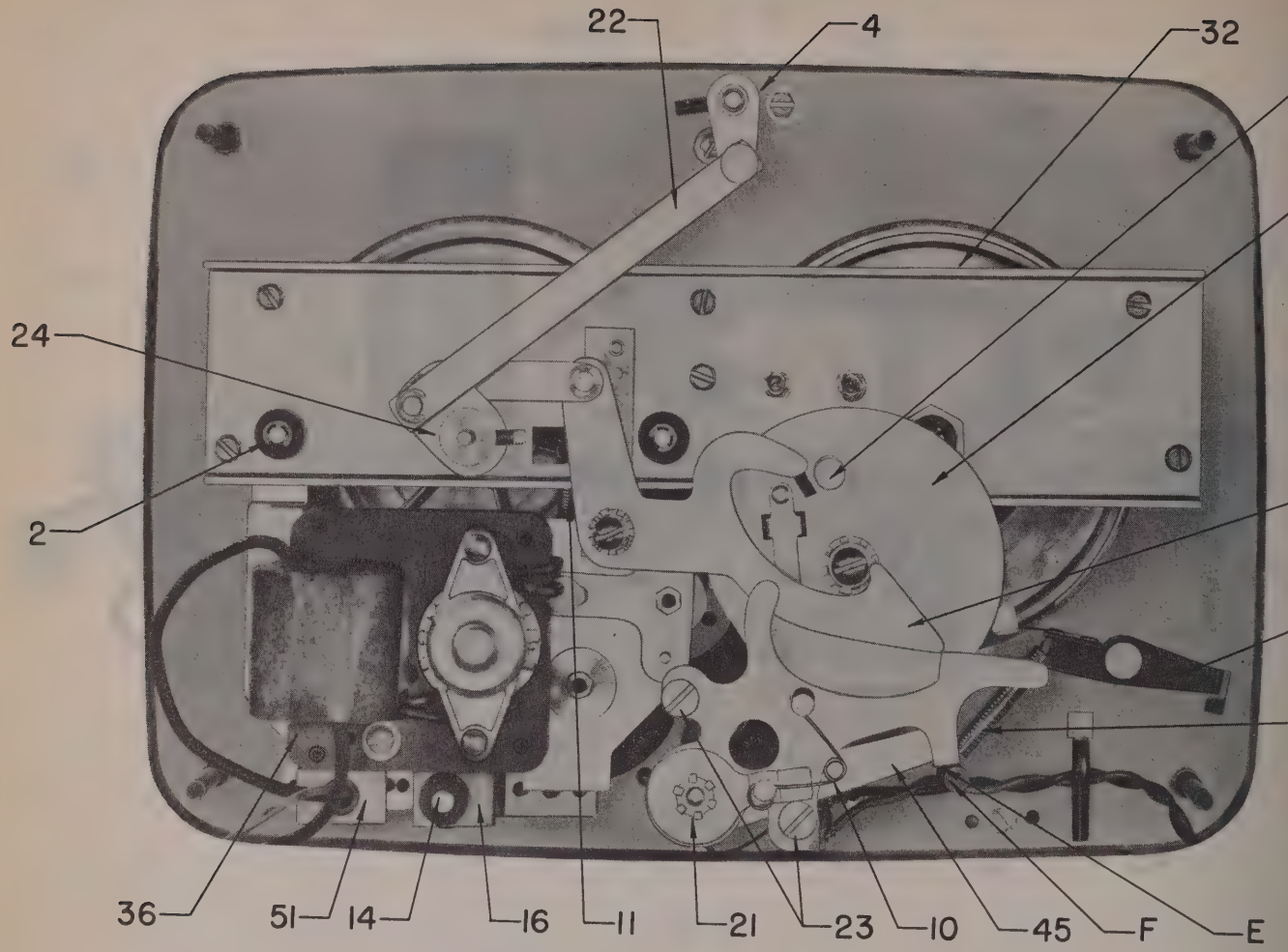


Fig. 3 Bottom View

CYCLING

The Motor shaft drives the turntable through the media of idler wheels. The motor shaft drives the fast idler wheel (48) which in turn drives the slow speed idler wheel (37) which then simultaneously rim-drives the 45 RPM and 33 1/3 RPM turntables. (See Fig. 9) The changer can be cycled either manually or automatically. The record changer cycles automatically in the following manner. As the tone arm moves towards the center of the record, the friction between the felt washer (46) and trip actuator stud assembly (45) created by the brass weight (5) carries the trip actuator and stud assembly (45) in towards trip lever (47) (See Fig. 2). When the nylon stud on (45) contacts surface (C) on trip lever (47), the entire trip lever is rotated (direction B) around axis (A). This swings trip actuator in (direction B) and allows pawl (44) to rise and engage the upper clutch plate assembly (35). (See Figs. 4 & 5) The upper clutch plate assembly (35) is continually rotating and this places the changer in cycle.

When the clutch pawl (44) mechanically connects the upper clutch assembly to the lower clutch assembly, the entire clutch assembly rotates. As the lower clutch plate assembly (43) rotates, the nylon bushing (D) cont throwout cam and lever assembly (21) thus moving tone arm from the record finish position to a posi over the tone arm captivator. (See Figs. 2 & 3) As lower clutch assembly continues to rotate, the ny bushing (D) contacts the inside surface of throwout and lever assembly thus returning the tone arm to re start position. Simultaneously the bushing (D) on lower clutch assembly (43) contacts the ejector assembly (31) and a new record is dropped on the tu table. This actuates the 33 1/3 RPM ejector cam an the same time actuates the ejector mechanism on th RPM spindle. The ejector shaft and plate assembly in the 45 RPM spindle rotates (See Fig. 8) automatic inserting record separators (29) between the bottom cord and the record stack and then retracts the rec supports (28) from beneath the last record, dropping record. The record ejector shaft (26) turns again pla the record supports (28) out under the record stack the record separators (29) retract, thus lowering the cord stack on the record support plates. At the sa time the eccentric shaped lower clutch assembly actuates the tone arm lift lever and pin assembly (17) raising and lowering the tone arm in the proper sequ

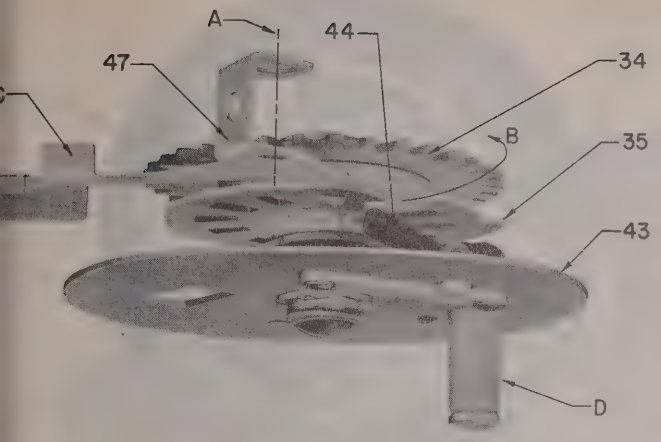


Fig. 4 Clutch Assembly with Pawl (44) Disengaged

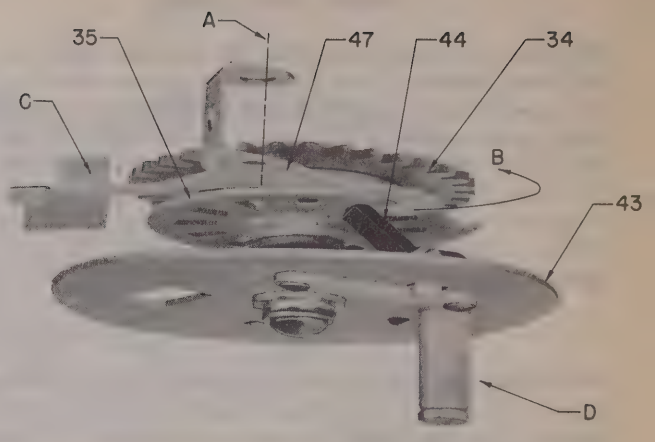


Fig. 5 Clutch Assembly with Pawl (44) Engaged

LUBRICATION

dditional lubrication should not be required for the life the changer, but in cases of unusual use, or high erating temperature, the changer should be lubricated follows

ubricate the following places with #10 light machine oil:

33 1/3 RPM ejector shaft (4) near base plate.
Rivet and shoulder stud on 33 1/3 ejector shaft (22).
Rivet and shoulder stud on 45 RPM ejector link (24).
45 RPM ejector shaft spindle mounting plate (26).
Trip lever (47) in two places on its pivot shaft.
Reject lever (41) at the reject lever pivot.
Link lever (17) on the shaft pivot.

TONE ARM HEIGHT ADJUSTMENT

ne tone arm height adjustment determines vertical rise the tone arm. If the tone arm does not rise sufficiently will not play a full stack of twelve records. (See Fig. On the other hand, if the tone arm raises too high it ay hit the records resting on the record shelf. Set the ne arm height adjustment screw (6) so that the needle ears twelve unwarped records on the turntable. The ne arm housing must not hit the under side of the re- rds on the record shelf when the changer is cycled ter adjustment.

TONE ARM SET-DOWN ADJUSTMENT

ith the tone arm locked in the tone arm captivator, the p between surface (E) on throwout cam and lever sembly (21) and aligning stud (F) should be adjusted so is 1/4". (See Fig. 3) Adjusting stud (23) on the 33 1/3 PM side should be in as far an outward position as ssible during this operation. When the gap is 1/4", the ab head screws should be tightened on the tone arm aft. Then the adjusting studs (23) can be rotated for al minor indexing of 33 1/3 and 45 RPM tone arm set- wn positions.

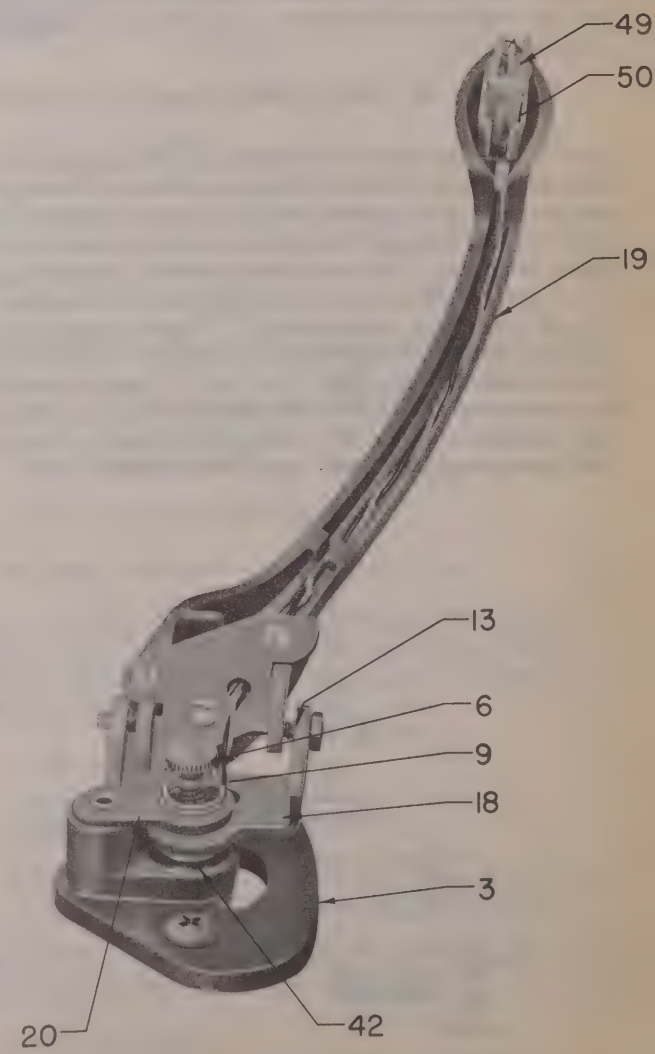


Fig. 6 Tone Arm & Hinge Assembly

TONE ARM HINGES

The tone arm hinge adjustment must be made in the following manner. (See Fig. 6) Insert an Allen wrench into special set screw (13) and hold it in this position. With a hex head wrench loosen the hex nut around this set screw. Then tighten set screw to a point where the tone arm moves freely in the vertical position but still does not have any lateral motion. Hold the set screw (13) firmly in this position with the Allen wrench, and then tighten the hex head nut.

SLAB HEAD SCREWS

For maximum rigidity the tone arm shaft and 45 RPM spindle shaft are locked into position with slab head screws. The slab head set screw wrench is available as part number 68-8.

MANUAL TRIP ADJUSTMENT

The manual trip with the brass spring should be adjusted so there will be 1/8" clearance between the spring and surface (C) on trip lever (47). (See Fig. 4) There should also be .020 to .040 clearance between trip lever (47) and the top surface of the lower plate of the lower clutch assembly (43).

THEORY OF THE COBRA RADIONIC PICKUP

The operation of the Cobra pickup is considerably different from Crystal and Dynamic pickups. These pick-ups generate audio power, while the Cobra controls power generated by a radio frequency oscillator, detector and audio amplifier. The oscillator operates at a frequency of 2.5 Mc. Modulation is accomplished by changing the energy losses in tuned circuit. These losses may be represented by an equivalent resistance in series with the reactance of the coil.1 The ratio of the resistance to the reactance determines the efficiency of Q of the coil. The amplitude of the RF voltage developed across this coil by an oscillator will vary with changes in Q.

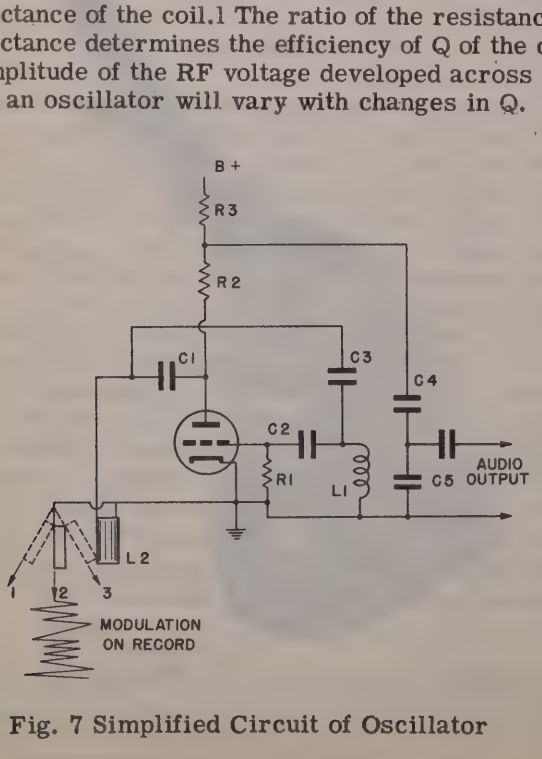


Fig. 7 Simplified Circuit of Oscillator

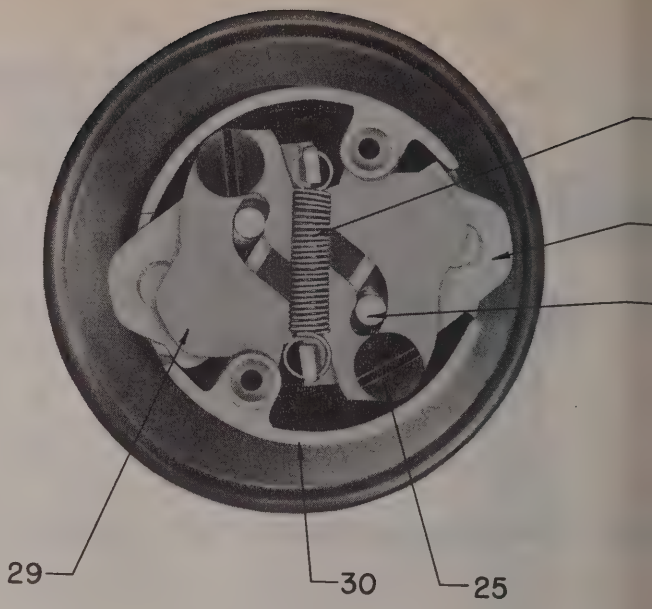


Fig. 8 45 RPM Spindle Assembly

The grid coil L1 and other components of the oscilla are mounted in the oscillator pre-amp chassis, while plate coil L2 is in the needle cartridge with the vane needle assembly. The coil is fixed and has 40 turns No. 40 wire (approximate DC resistance 2 1/2 ohm The stainless steel vane, which is in the field of the c is spot welded to the osmium-iridium tipped styl

Any movement of the stylus will cause a correspond movement of the vane. As the stylus and vane follow modulations in the record, changes in the mutual ductance between the vane and coil occur (See Fig. 7) position 2 the vane is at rest, and a constant RF volta appears across the plate coil. As the vane is set motion and reaches position 1, it is at its greatest o ward swing from the coil, resulting in low mutual ductance, low relfected resistance, higher Q, and a high RF voltage across the coil. In position 3 it is at greatest inward swing; resulting in a high mutual ductance, high relfected resistance, lower Q and a low RF voltage. It can be seen that the amplitude of the voltage which appears across the coil will vary w changes in Q, satisfying the condition for amplitu modulation. The position of the vane changes both the and L of the coil. Changes in L shift the frequen slightly, and a certain amount of frequency modulation present, but since there is no frequency discrimination remains undetected. Since the grid and plate coils a part of a single tuned circuit any variations of amplitu of the RF voltage brought about by the changes in across the plate coil will also appear across the gr coil L1, causing a shift in the average plate curre through the plate load resistor across which the aud output voltage is developed. Plate bend detection tak place since only the positive half of the grid swing caus an increase in the average plate current. These chang in the average plate current appear as audio volta across the plate load resistor.

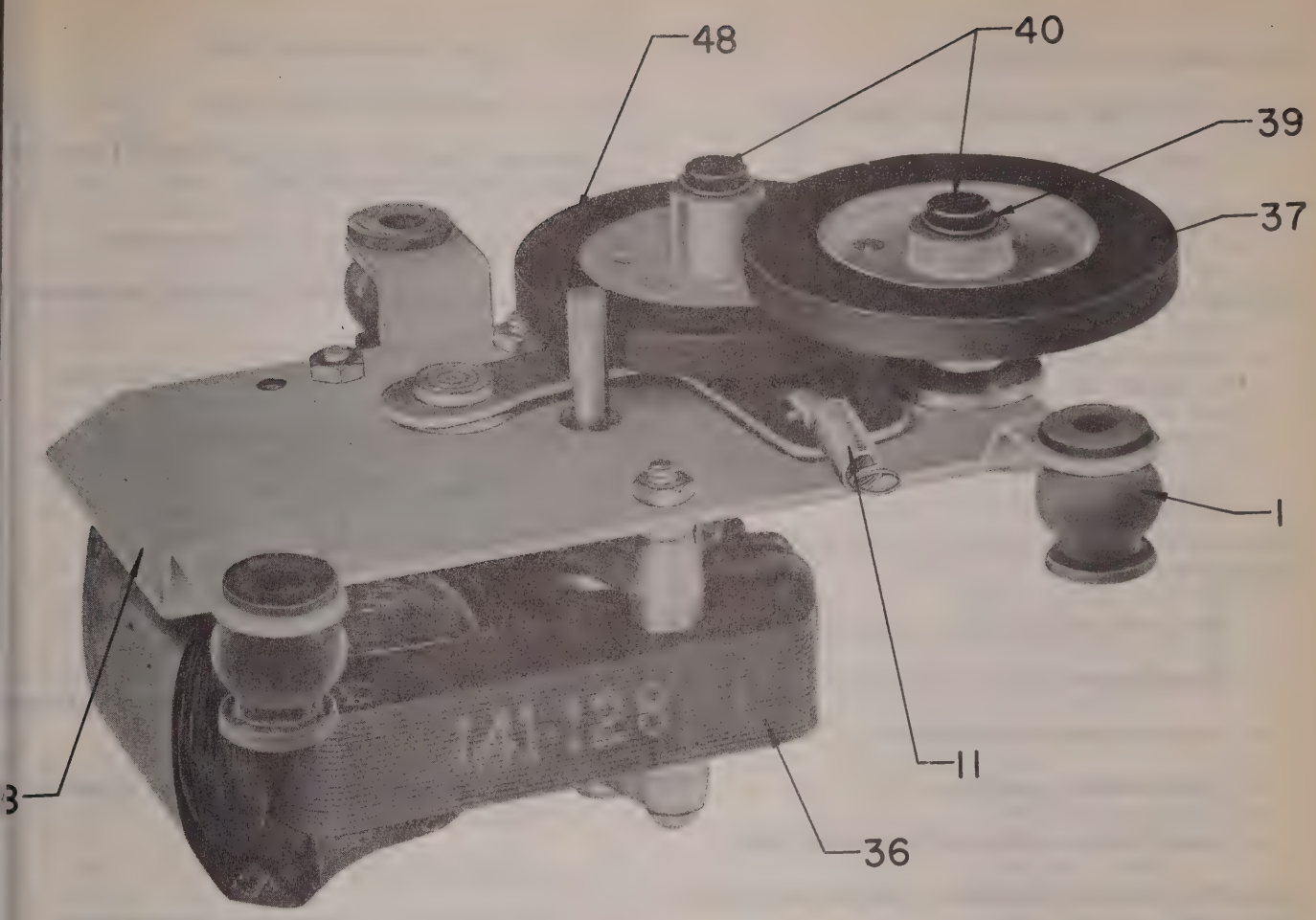


Fig. 9 Motor & Idler Wheel Assembly

e 2.5 Mc RF voltage and the audio voltage both appear he plate (pin 6) of the oscillator triode. R2, C4 and C5 er out the RF voltage allowing only the audio com- ent to the grid (pin 4) of the amplifier triode where it mplified, fed through a shielded lead to the audio plifier of the receiver and reproduced by the loud- aker.

EDLE DOES NOT TRACK ACROSS RECORD)PERLY.

a. Clean foreign material from around needle.

b. Check needle to see if the tip is bent or broken. Replace needle.

c. Hinge bearing binds. Check lateral movement of tone arm. It must move freely without binding.

d. Excessive vibration while playing an LP record. Any vibration caused by (1) unsteady mounting, (2) floor vibration, or (3) passing of heavy vehicles may cause the pickup to glide across the record grooves.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT.

a. Check line voltage and frequency.

b. Check lubrication.

c. Motor windings damaged.

d. Room temperature abnormally low.

MOTOR FAILS TO RUN EVEN WHEN IT IS DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING.

a. Open windings.

b. Damaged or frozen bearings.

c. Lower Rear Support Bracket bent. Remove and straighten bracket--Re-center armature.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES.

a. Cabinet tilted.

b. Badly worn or broken needle cartridge.

TONE ARM FALLS OFF RECORD.

a. Check Tone Arm set-down adjustment.

b. Check Tone Arm Pivot Bracket.

c. Changer not level.

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

a. Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.

b. Check lubrication.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

a. See that the Band switch is on Phono.

b. Check receiver audio by listening to radio.

c. Check the phono oscillator tube.

d. Check Needle Cartridge.

e. Check Tone Arm Housing for broken leads.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

a. Changer not "floated" properly. Remove packing Strip. Loosen mounting bolts.

b. Motor leads pulled too tight preventing motor from "floating" freely.

c. Noisy phono oscillator tube.

d. Impression on Idler Wheel.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF CORDS ON THE TURNTABLE.

a. Check Tone Arm height adjustment.

TONE ARM SETS DOWN TOO FAR IN OR OUT O RECORD.

a. Check Tone Arm set-down adjustment.

TONE ARM SET-DOWN VARIES.

a. Tone Arm pivots loose.

CHANGER CONTINUES TO CYCLE.

a. Check the trip switch adjustment.

b. Trip Pawl sticks.

CHANGER WILL NOT CYCLE UPON COMPLETI OF RECORD.

a. Be certain that the record has an eccentric ce groove.

b. Check trip pawl.

RECORD BINDS ON OPPOSITE TURNTABLE.

a. If 33 1/3 RPM records rub on 45 RPM turnta remove 33 1/3 turntable and raise it by pla washers between 33 1/3 RPM mounting and t table. This will raise the level of the 33 1/3 cords so they will clear the 45 RPM turnt

DIAG NO.	PART NO.	DESCRIPTION	PRICE
-125-77		Motor Mtg. Grommet (3 used)	.20
- 93-1018		Motor Mtg. Washer (Bakelite) (6 used)	.01
-199-123		Tone Arm Sleeve	.20
-199-122		Ejector Shaft Sleeve	.05
-135-15		Weight	.20
-112-778		Adj. Screw (Lift Pin)	.02
- 84-72		Record Support	.20
- 84-73		Tone Arm Rest	.10
- 80-750		Adj. Spring (Lift Pin)	.01
0-80-752		Tone Arm Positioning Spring	.05
1-80-753		Idler Wheel Tension Spring	.05
2-80-754		Reject Lever Return Spring	.07
3-73-121		Special Set Screw	.12
4-56-277		Grommet Retaining Pin	.02
5-15-93		Spindle Cap (Red)	.20
6-12-1661		Motor Mtg. Brkt.	.10
7-S-16080		Lift Lever & Pin Assem.	.06
8-S-16074		Swivel Brkt. & Shaft Assem.	.35
9-S-16073		Tone Arm Assem. (Complete less Cart.)	.60
0-S-16075		Lift Pin & Plate Assem.	.10
1-S-16076		Throw-Out Cam & Lever Assem.	.65
2-S-16071		Ejector Lever Link & Bushing Assy.	.10
3-97-357		Adjusting Stud	.15
4-S-16070		Ejector Lever & Bushing Assem.	.20
5-112-776		Shoulder Screw (2 used on S-16067)	.05
6-S-16066		Ejector Shaft & Plate Assem.	.30
7-80-749		Record Support Spring	.06
8-57-1555		Record Support (2 used on S-16067)	.20
9-83-1666		Record Separator	.04
0-76-557		Upper Spindle	1.20
1-S-16069		Ejector Cam & Bushing Assem.	.25
2-S-16065		Turntable & Bearing Assem. (33 1/3 RPM)	2.25
3-S-16061		Spindle & Dog Assem. (33 1/3 RPM)	1.50
4-34-196		Clutch Gear	.45
5-S-16063		Clutch Plate Assem. (Upper)	.90
6-141-128		Motor 115V 60 Cycles	7.50
7-61-142		Idler Wheel - Slow	.80
8-S-16058		Motor Mtg. Plate & Lever Assem.	.40
9-93-678		Fish Paper Washer	.33C
0-76-561		Idler Wheel Shaft (2 Used)	.15
1-S.16057		Reject Lever & Spring Assem.	.10
2-93-1015		Thrust Washer (used on S-16074)	.03
3-S.16064		Clutch Plate Assem. (Lower)	1.00
4-60-21		Pawl	.55
5-S-16079		Trip Actuator & Stud Assem.	.20
6-93-1017		Felt Washer (used on S-16079)	.02
7-117-180		Trip Lever	.07
8-61-143		Idler Wheel - Fast	.90
9-S-15222		Cobra Tone Arm Cartridge	3.50
0-12-1658		Cartridge Retaining Brkt.	.05
1-85-471		Switch	.10
2-S-16072		Ejector Shaft & Plate Assem.	.65
3-S-16104		Turntable & Ring Assem. (45 RPM)	2.70
4-102-626		Decal	

PART. NO.	DESCRIPTION	PRICE
12-1659	Tone Arm Brkt.	.05
19-123	Record Changer Mtg. Clip	.10
54-62	Hex Nut for 45 RPM Spindle Bushing	.03
54-299	4-40x3/16 A.F. x 1/16" thk. Hex Nut Steel-Stat. Br.	.02
54-300	Hex Nut for 33 1/3 RPM Spindle Sleeve	.04
56-275	Lift Pin	.04
58-75	Single Contact Plug	.07
58-86	Two Prong Plug	.12
69-108	#6-32x1/4 R.H.M.S. Brass-Plain (used on S-16069)	.02
73-70	8-32x1/2" Allen Hd. Set Screw Cuppoint (used on S-16067)	.08
73-112	8-32x1/2 Slab Hd. Set Screw Cuppoint (1 ea. used on S-16070, S-16071, 2 ea. on 76-560)	.12
73-124	6-32x3/8" lg. Slab Hd. Set Screw Conept. (2 used on S-16076)	.02
76-560	Spindle Shaft (45 RPM)	.40
80-748	Reject Lever Spring	.01
80-751	Lift Pin Return	.01
93-143	Shakeproof Lock washer for 45 RPM Spindle Bushing	.01
93-1011	Turntable Retaining Washer (used on S-16065)	.02
93-1012	Shakeproof Lock washer for 33 1/3 Spindle Sleeve	.02
93-1013	Thrust Washer (1 ea. used on S-10665 and S-16104)	.01
93-1014	Lift Pin Washer	.02
93-1035	Retaining Washer	.03
94-682	45 RPM Spindle Bushing	.50
94-684	33 1/3 RPM Spindle Sleeve	.40
112-573	#2-32x1/4 R.H.S.T. Screw Shakeproof Cad.	.01
112-777	#4-40x3/4 Oval Phill. H. M.S. Steel Stat. Br. (2 used on 15-93)	1.40C
112-779	6-32x3/8 Phill. B. H. M. S. Stat. Br. (1 ea. used on 12-1661, 2 ea. used on 199-123)	1.20C
113-21	Hex Head Screw for Mtg. Lower Clutch Assem.	.02
114-253	6-20x3/8 Hex Hd. Sl. S. T. Screw (1 used on 84-73, 2 used on 84-72)	.84C
125-76	Rubber Grommet	.25
148-119	Tone Arm Only	.35
188-128	Retaining Ring (5 used)	.07
188-129	Retaining Ring (3 used Motor Mtg.)	.08
S-16060	Spindle Mtg. Plate Assem.	2.60
S-16067	Upper Spindle Assem. (45 RPM)	1.85
S-16091	Plug & Wire Assem.	.15
S-16505	Cable Assembly (S-14026)	.55

Prices shown above are suggested list prices and are subject to change without notice.

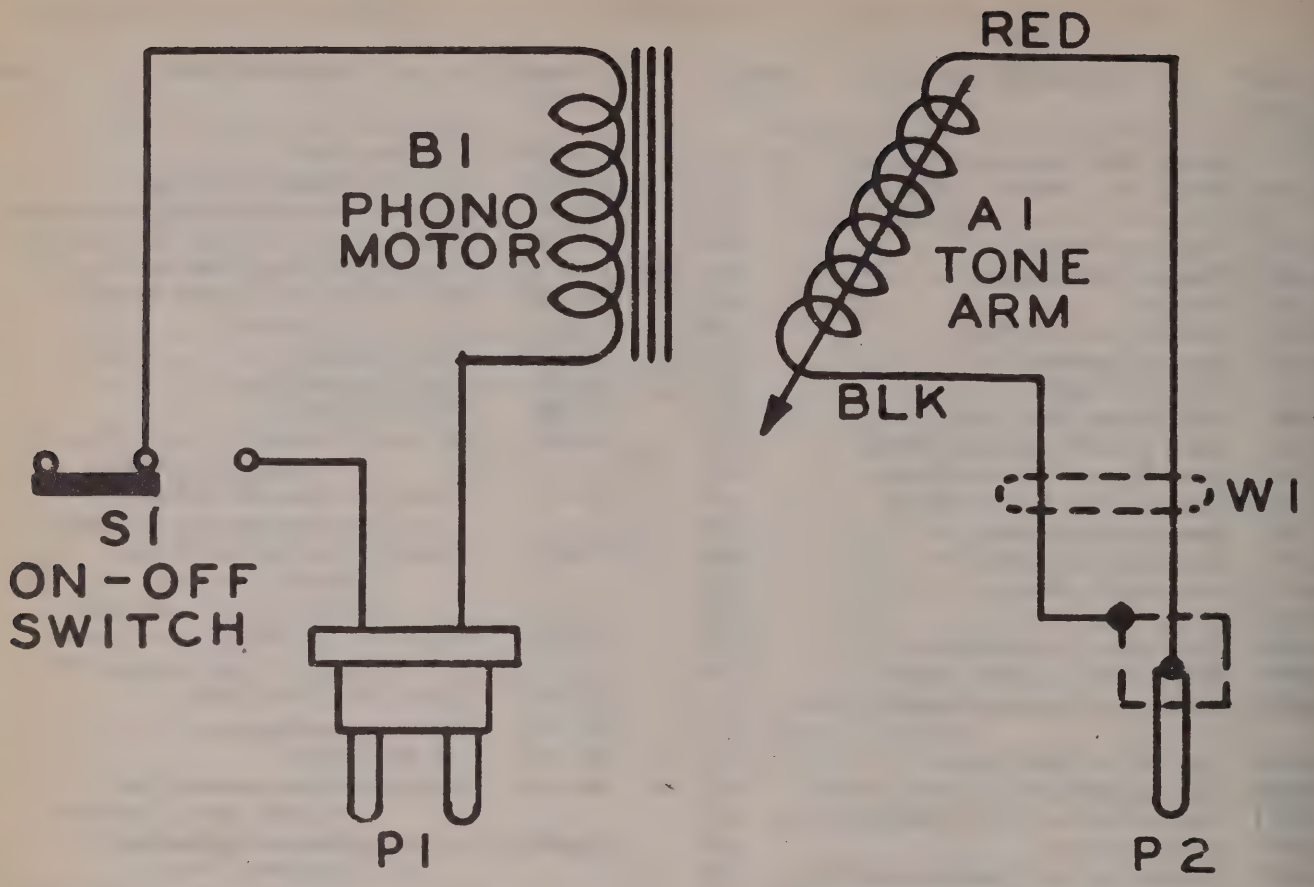
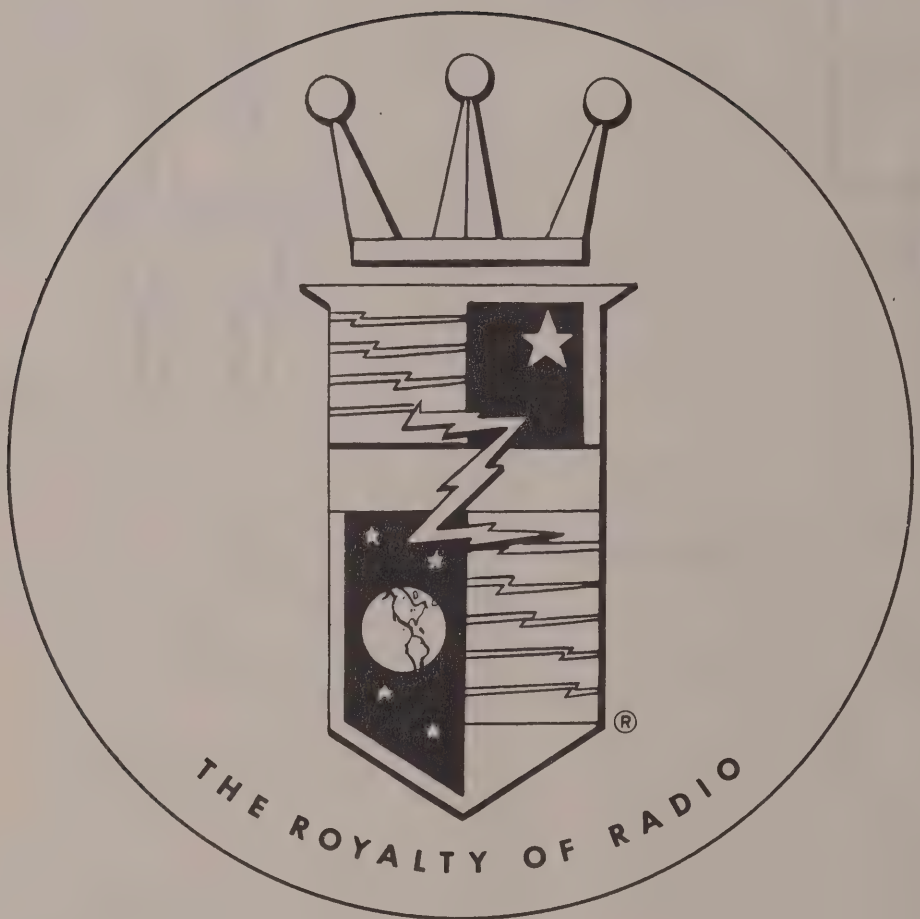


Fig. 10 Schematic for S-14023 and S-14026

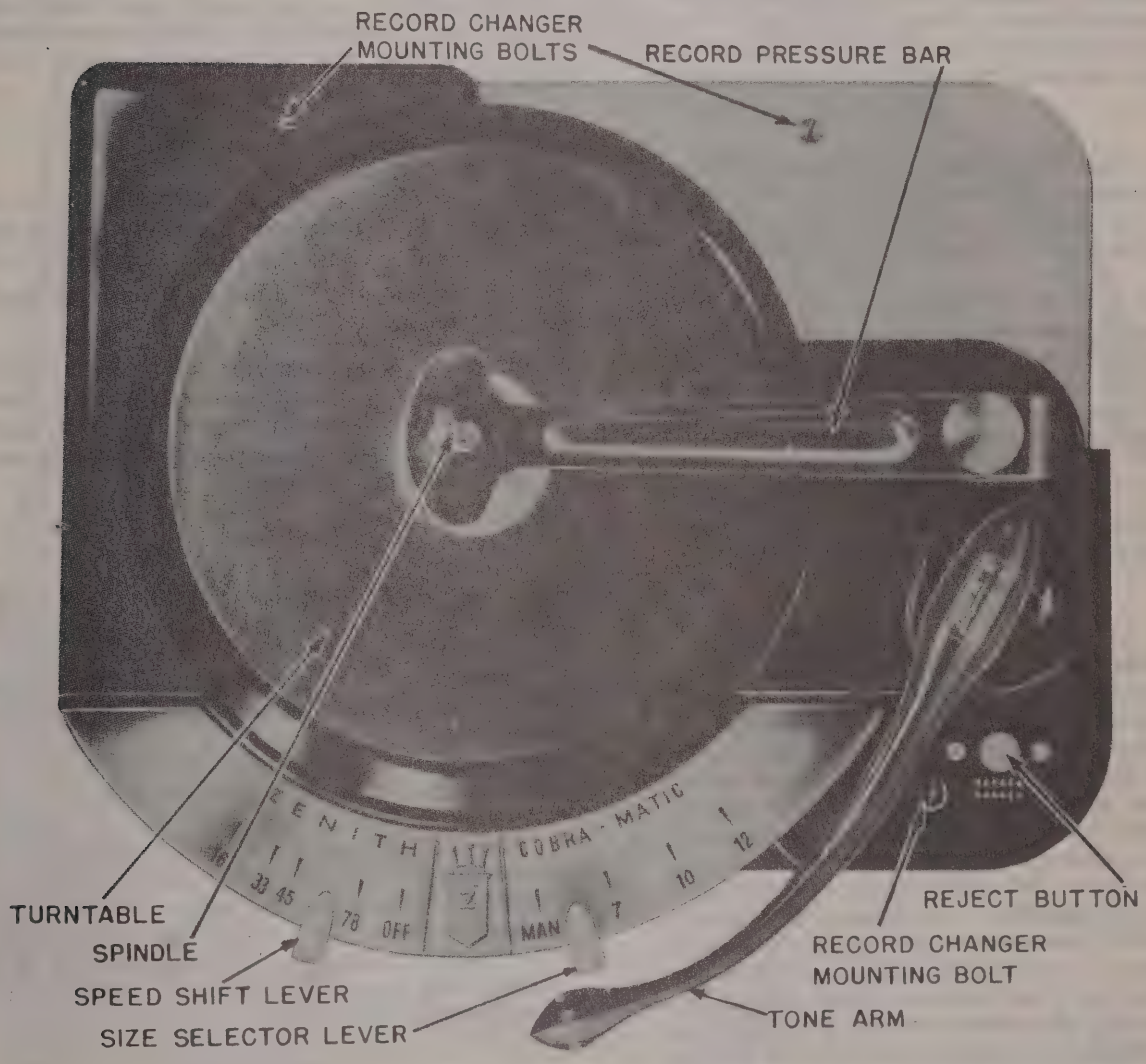
MEMO


THE ROYALTY OF RADIO

ZENITH

REG U.S. PAT. OFF.

SERVICE MANUAL



COBRA-MATIC RECORD CHANGERS

MODELS S14028, S14029, S14030, S14031 and S14036

ZENITH RADIO CORPORATION

6001 DICKENS AVENUE • CHICAGO 39, ILLINOIS

GENERAL DESCRIPTION

The Zenith Models S-14028, S-14029, S-14030, S-14031 and S-14036 Record Changers are designed to play standard 78, 45 and 33 1/3 RPM records of standard commercial dimensions. With few minor exceptions these five changers are alike electrically. The basic changer for S-14029, S-14030 and S-14031 is the S-14028. The addition of cable assemblies for tone arm and AC connections are the determining factors between S-14029, S-14030 and S-14031. The only difference in these cables is lead length and plugs. S-14036 Record Changer is basically identical to S-14028 except it uses a 50-60 cycle motor and is used primarily for the export market. The other difference is the tone arm and AC connecting cables.

Features of these changers include playing and automatically changing as many as ten 12" or ten 10" records. Ten inch and twelve inch records of the same type cannot be intermixed.

A full stack of 7" 33 1/3 RPM, or a full stack of 7" 45 RPM records (with adapter inserted in the records) can also be played on this changer. This changer does not shut off after the last record, however, all that is required to turn the changer off is to move the speed change lever (18) to OFF position.

Connect this changer only to an outlet supplying 117 volt 60 cycle A.C. unless specified otherwise. Power consumption is 25 watts.

SHIPPING BOLTS

Before placing the changer in operation, the machine must be floated freely on the mounting springs. During shipment, the changer is secured to the changer base pan be means of three mounting bolts. To float the changer, take a wide-blade screw driver and turn down these bolts until they are flush with the record changer base plate. During shipment the motor and motor mounting plate (65) (66) is bolted to the changer base plate. Before the record changer can be operated, motor mounting screw (9) must be removed. As you can see, fastening the motor mounting plate (66) with motor mounting screw (9) to the record changer base plate prevents the motor drive shaft from contacting the rubber surface of drive wheel assembly (36) and prevents a possibility of damage to drive wheel assembly from rough handling during shipment.

LEVELING THE RECORD CHANGER

It is essential to have the record changer absolutely level. Use either a torpedo or similar type level on the record changer base plate. Use adequate shims to level the record changer pan or the combination cabinet to achieve perfect level.

LOADING THE RECORD CHANGER

1. Pull straight up on the record pressure arm knob (12) until the record pressure arm clears the spindle. Swing the record pressure arm to the right until pins in pressure arm shaft (14) drop into locating slot on record pressure arm housing (1).

2. Changer will automatically play ten 12" either standard or Long Play, ten 10" either standard or Long Play or ten 7" Long Play or Fine Groove records.

NOTE: Standard, Fine Groove and Long Play records cannot be played in the same stack of records. Speed change lever (18) must be re-set for each type of recording.

3. Place records on spindle and lower them to offset shelf. Level records and replace record pressure arm (14) over spindle and lower this until it rests on the top of the record stack.

To play standard 78 RPM recordings:

1. Motor speed control lever (18) must be set to 78 position. This will set the record changer to proper speed position and cause the turntable to rotate.

2. Set-up lever (17) must be moved to the size records being played.

3. Place the changer in cycle by depressing reject switch knob (73). The changer will play the remaining records automatically. The changer will continue to play the last record until speed change lever (18) is moved to OFF position.

To play 33 1/3 RPM records:

1. Motor speed change lever (18) must be in 33 1/3 position.

2. Set-up lever (17) should then be moved to either 12", 10" or 7" position depending on the size record being played.

To play Fine Groove (45 RPM) records:

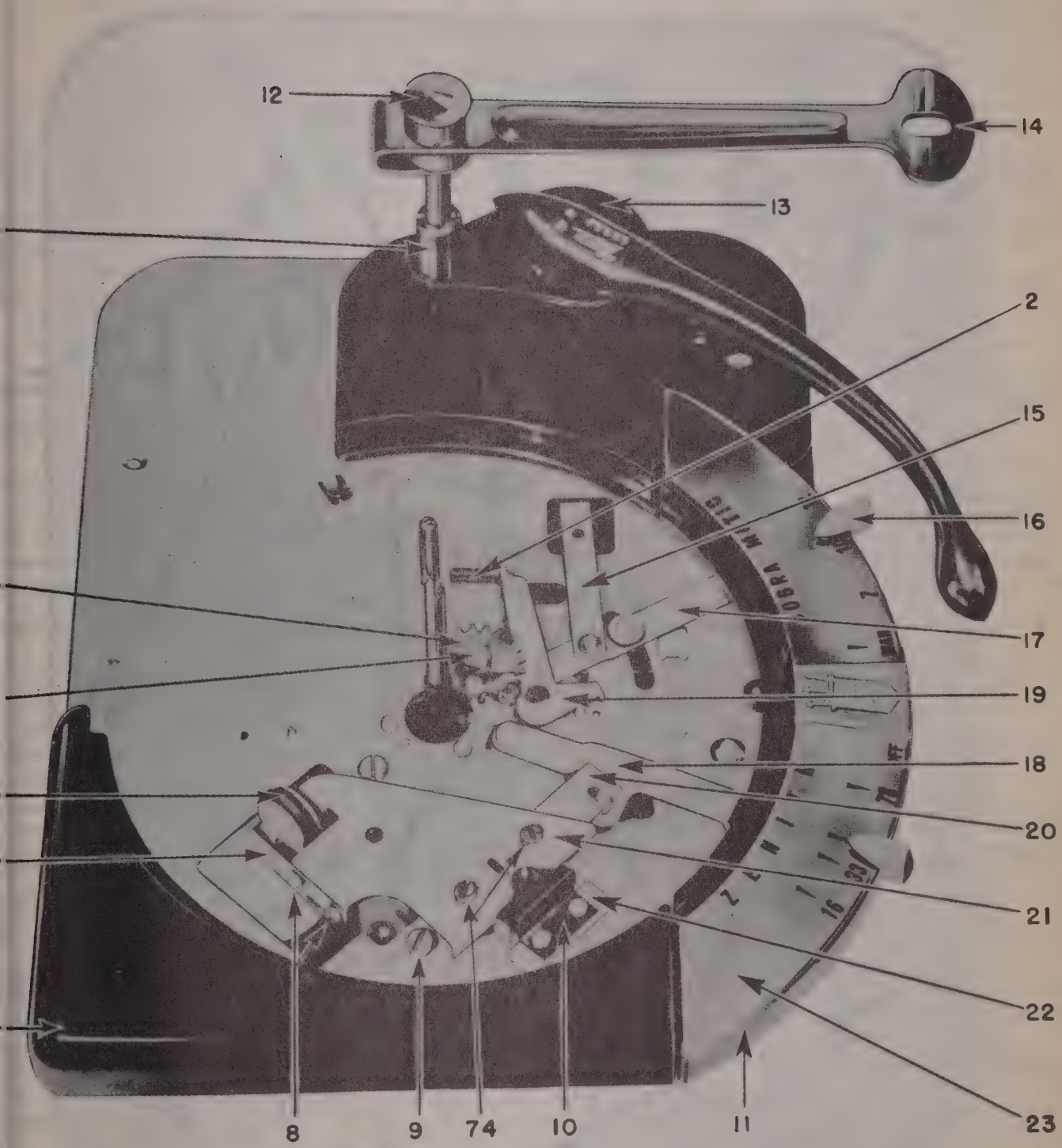
1. Speed change lever (18) should be moved to 45 position and set-up lever (17) should be in 7" position. It must be remembered that these records are manufactured with a 1 1/2" spindle hole so it is essential that a record adapter be inserted into each 45 RPM record to be played. This is necessary to reduce the spindle hole to conventional size.

REJECTING

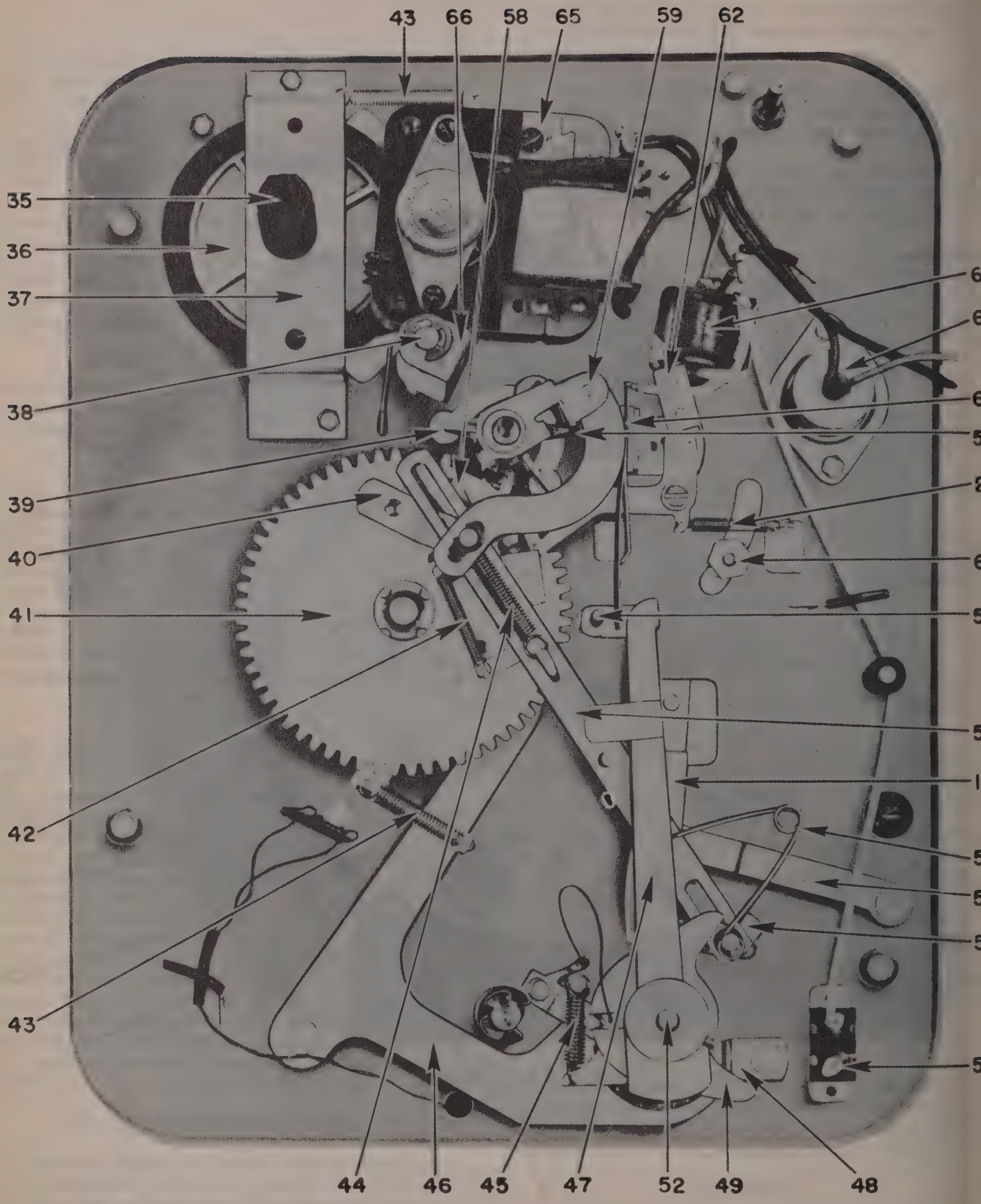
To reject a record anytime, while the changer is operating, depress reject switch button (73) and release. This will automatically cause the record changer to go through cycle and begin playing the next record.

STOPPING

To turn off the record changer all that is required is to move the speed shift lever (18) to OFF position.



Record Changer Top View with Turntable Removed



Record Changer Bottom View

UNLOADING

ift the record pressure arm (14) and swing it to the ght until the pin on the shaft drops into the locating roove on record pressure arm shaft housing (1). Lift ack of records straight up on spindle.

MANUAL OPERATION

o play single records or home recordings, lift up the ecord pressure arm and turn it to the right. Place ecord on spindle and lower to the spindle shelf. ently push record towards record pressure arm haft and lower to turntable. Move speed change ever (18) to proper speed for type of record being layed and move set-up lever (17) to manual position. ick up tone arm and place the needle on the lead-in roove of the record.

CAUTION

hen changing needles be certain that only a Red-reen cartridge is used, S-15780. This will accom-odate 78, 45 and 33 1/3 RPM records.

DESCRIPTION OF CYCLING

he motor shaft contacts drive wheel assembly (36) nd causes it to rotate by friction contact with its ubber surface. Drive wheel assembly (36) drives dler wheel (5). The underside of the turntable is in ontact with idler wheel (5) and is driven in this anner. Speed of the turntable is controlled by hanging the position of the idler wheel (5) on drive heel (36). When idler wheel is moved to the center f drive wheel (36) it will rotate more slowly than hen moved to the outer edge of this drive wheel (36). n this manner the turntable can be driven at any peed from 10 to 85 RPM. Minor adjustments for roper tonal pitch can be made by simply moving peed change lever (18) back and forth to compensate or turntable speed which may vary due to line voltage hanges. When reject button (73) is depressed it nergizes solenoid (61) which then attracts trip pawl ssembly (62). The same thing occurs when the for-ard movement of the tone arm causes friction lever nd weight assembly (47) to contact the copper bronze ontact on trip switch assembly (63). When gear seg-ent (58) is released, gear pawl spring (42) causes he gear segment (58) to engage the rotating pinion ear (25) under the turntable thus causing clutch ssembly (41) to rotate.

s clutch assembly (41) rotates, tone arm lift lever 46) swings in such a manner that it contacts tone arm ift pin and raises the tone arm. Simultaneously, tone rm link and stud assembly (56) slides towards, and ontacts one finger of tone arm lever assembly (49) rcing the tone arm towards the outer edge of the urntable and then on its return swing contacts the other finger of tone arm lever assembly (49) swinging the tone arm back over the records. The position to which it swings the tone arm over the records is determined by the position of record size discriminator (51). There are three steps on the record size discriminator (51) which determines set-down position for 7", 10" and 12" records. The tone arm lift lever (46) returns and releases brake lever assembly (48) which keeps the tone arm from moving erratically during cycle. Simultaneously, ejector lever and link assembly (59) rotates and this in turn causes spindle shaft (30) to rotate and ejector cam (29) to push the record off the spindle shelf. Operation of the tone arm set-down adjustment can be observed by raising the tone arm so the adjustment mechanism can be viewed.

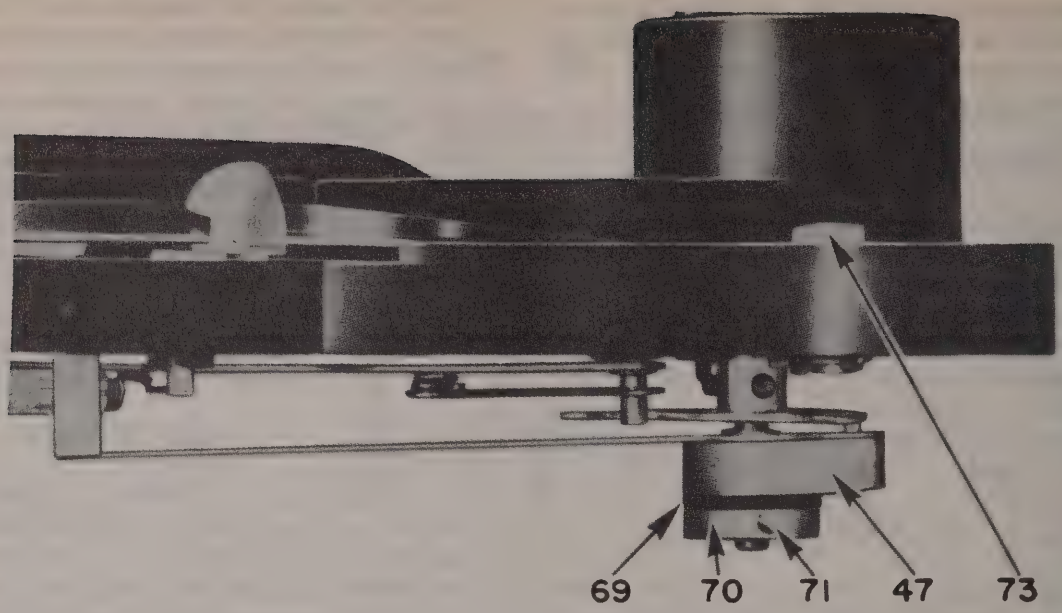
VELOCITY TRIP

This changer is provided with what is commonly known as a velocity trip rather than a ratchet and positive trip mechanism. A velocity trip depends for the tripping action on the rate of forward motion of the pickup arm with respect to the turntable rotation. The changer will trip only when the tone arm advances more in one revolution of the turntable than the distance between normal grooves in a record. Only records having fast finishing grooves will operate the velocity trip. During the normal playing cycle, friction lever and weight assembly (47) continually moves forward toward the copper bronze contact on trip switch assembly (63).

On normal forward advance, the friction lever and weight assembly (47) is kept from contacting the copper bronze contact by a wiping action from oscillating lever stud assembly (55). The oscillation of oscillating lever and stud assembly is produced by eccentric motion of oscillating gear (4) which is driven by the pinion gear (25) on the lower portion of the turntable. Oscillating gear (4) is mounted off-center so it will describe an eccentric action as it is being driven by the turntable gear. The tone arm moves in towards the center of the record and the repeated action of oscillating lever (55) keeps friction lever and weight assembly (47) from coming in contact with the copper bronze strip on trip switch assembly (63) as the pickup arm moves slowly towards the spindle and lead-in grooves. During the first revolution of the turntable, in the eccentric cycling grooves, the pickup arm advances rapidly and friction lever and weight assembly (47) is moved forward fast enough so that oscillating lever (55) does not halt its progress, therefore, friction lever and weight assembly (47) contacts the copper bronze trip contact on trip switch assembly (63) grounding it and making a complete circuit. This actuates solenoid (61) causing the changer to cycle.

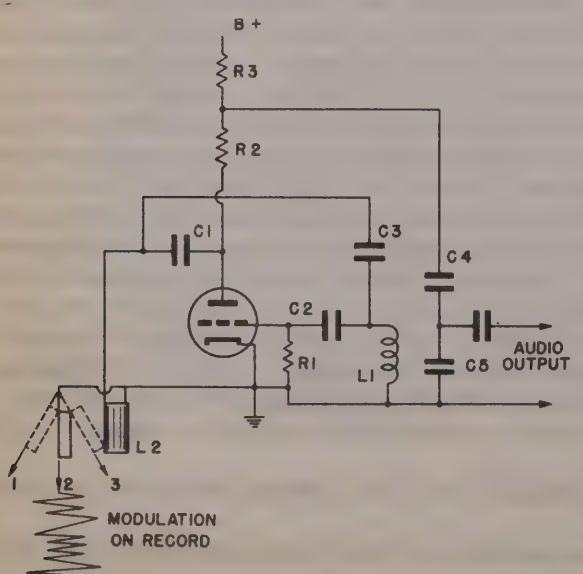
THEORY OF THE COBRA RADIONIC PICKUP

The operation of the Cobra pickup is considerably



Tone Arm Friction Lever Detail

different from Crystal and Dynamic pickups. These pickups generate audio power, while the Cobra controls power generated by a radio frequency oscillator, detector and audio amplifier. The oscillator operates at a frequency of 2.5 Mc. Modulation is accomplished by changing the energy losses in a tuned circuit. These losses may be represented by an equivalent resistance in series with the reactance of the coil. The ratio of the resistance to the reactance determines the efficiency or Q of the coil. The amplitude of the RF voltage developed across this coil by an oscillator will vary with changes in Q.



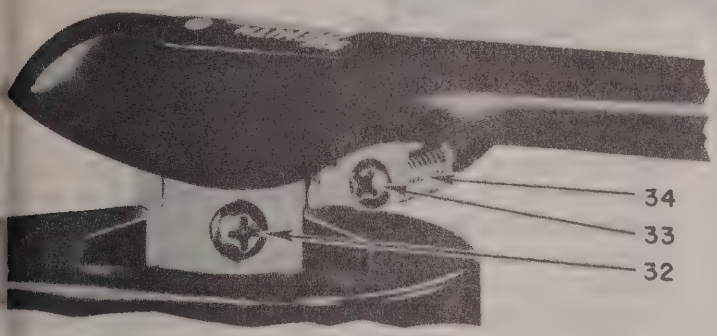
Simplified Circuit of Oscillator

The grid coil L1 and other components of the oscillator are mounted in the oscillator pre-amp chassis, while the plate coil L2 is in the needle cartridge with vane and needle assembly. The coil is fixed and has 40 turns of No. 40 wire (approximate DC resistance 2 1/2 ohms). The stainless steel vane, which is in the field of the coil, is spot welded to the osmium-iridium tipped stylus.

Any movement of the stylus will cause a corresponding movement of the vane. As the stylus and vane follow the modulations in the record, changes in the mutual inductance between the vane and coil occur. In position 2 the vane is at rest, and a constant RF voltage appears across the plate coil. As the vane is set in motion and reaches position 1, it is at its greatest outward swing from the coil, resulting in low mutual inductance, low reflected resistance, higher Q, and a higher RF voltage across the coil. In position 3 it is at its greatest inward swing, resulting in a high mutual inductance, high reflected resistance, lower Q and a lower RF voltage. It can be seen that the amplitude of the RF voltage which appears across the coil will vary with changes in Q, satisfying the condition for amplitude modulation. The position of the vane changes both the Q and L of the coil. Changes in L shift the frequency slightly, and a certain amount of frequency modulation is present, but since there is no frequency discrimination it remains undetected. Since the grid and plate coils are part of a single tuned circuit, any variations of amplitude of the RF voltage brought about by the changes in Q across the plate coil will also

appear across the grid of coil L1, causing a shift in the average plate current through the plate load resistor across which the audio output voltage is developed. Plate bend detection takes place since only the positive half of the grid swing causes an increase in the average plate current. These changes in the average plate current appear as audio voltage across the plate load resistor.

The 2.5 Mc RF voltage and the audio voltage both appear at the plate (pin 6) of the oscillator triode. R2, C4 and C5 filter out the RF voltage allowing only the audio component to the grid (pin 4) of the amplifier triode where it is amplified, fed through a shielded lead to the audio amplifier of the receiver and reproduced by the loud speaker.



Tone Arm Set-Down & Height Adjustments

SET DOWN ADJUSTMENT

When adjusting the tone arm for proper set-down on the edge of the record, move set-up change lever to 7" position, place a 7" record on the turntable, turn the record changer through cycle by rotating the turntable by hand. Watch closely where the needle point of the Cobra cartridge lands on the record and adjust tone arm set-down adjustment screw (33) until proper landing position is obtained.

TONE ARM HEIGHT ADJUSTMENT

The tone arm height adjustment determines vertical rise of the tone arm. If the tone arm does not rise sufficiently it will not play a full stack of twelve records. On the other hand, if the tone arm raises too high it may hit the records resting on the record shelf. Set the tone arm height adjustment screw (32) so that the needle clears twelve unwarped records on the turntable. The tone arm housing must not hit the under side of the records on the record shelf when the changer is cycled after adjustment.

SLAB HEAD SCREWS

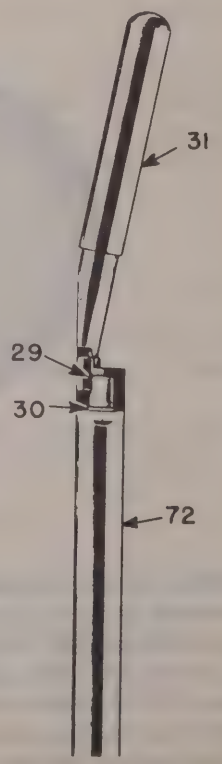
For maximum rigidity many components are locked into position with slab head screws. This type set screw provides a more positive grip. The slab head set screw wrench is available as part number 68-8.

SPEED INDICATOR ADJUSTMENT

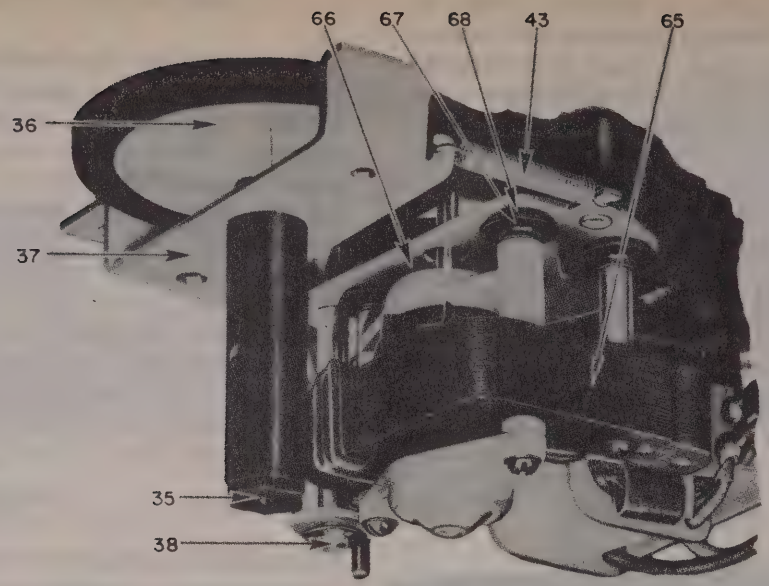
It is possible that the speed of the record changer may not conform to the speed stop on escutcheon (23). Proper adjustments can be made in the following manner. Put a stroboscopic disc on the turntable, adjust speed change lever (18) until the turntable is turning at exactly 78 RPM. Stop the record changer by pulling the AC plug, remove the turntable, loosen the two adjusting screws (74) and move speed change lever (18) so that the point on the control knob indexes exactly at the 78 mark on the escutcheon (23). Then re-tighten adjusting screws (74) and replace the turntable. The turntable should now rotate at exactly 78 RPM, however, as a precaution, again check with the stroboscopic disc.

SPINDLE

The spindle on this record changer is composed of five separate parts. Spindle shaft (30) and ejector cam (29) are pressure-fit together and if either breaks, they cannot be replaced since the assembly operation is a machine operation. The spindle housing is composed of two separate portions which once again are pressure-fit together and require a machine operation for assembly. It is possible that spindle cap (31) may be pulled off spindle assembly (72) and if this does occur, it can easily be replaced by sliding a new spindle cap down over the spindle and then pressing in on the detent portion, which acts as a stop to keep the spindle cap from sliding off spindle (72). If breakage occurs other than loss of the spindle cap (31), the entire spindle assembly (72) must be replaced.

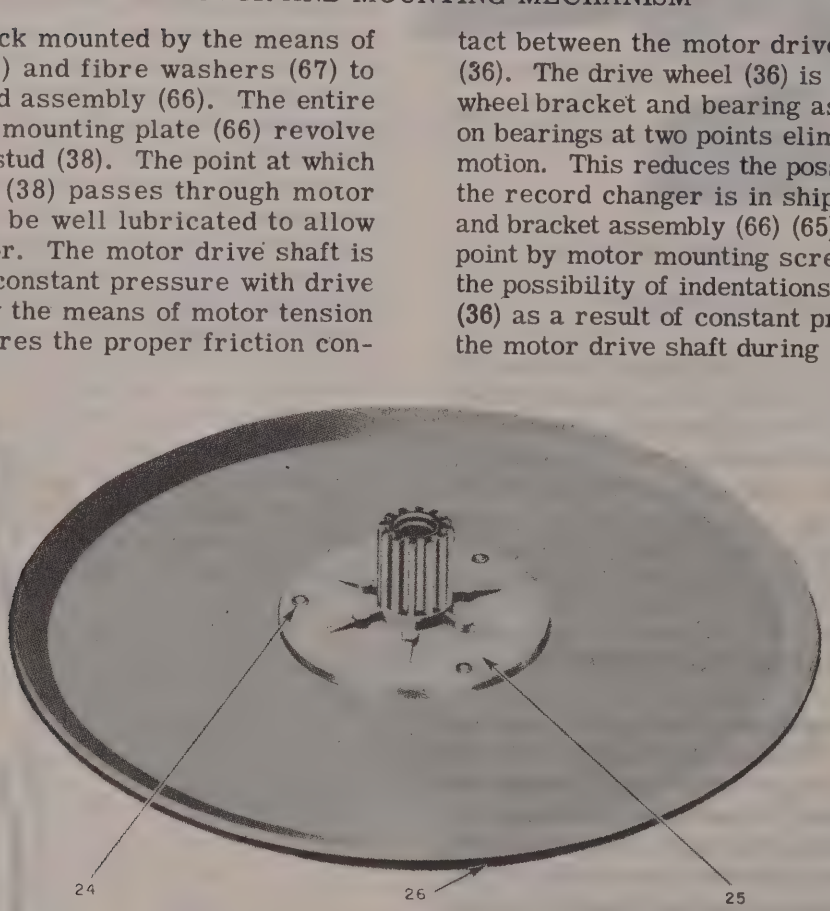


Spindle S-17424



MOTOR AND MOUNTING MECHANISM

The motor (65) is shock mounted by the means of rubber grommets (68) and fibre washers (67) to mounting plate and stud assembly (66). The entire motor (65) and motor mounting plate (66) revolve about motor mounting stud (38). The point at which motor mounting stud (38) passes through motor mounting plate should be well lubricated to allow free action of the motor. The motor drive shaft is kept in contact and in constant pressure with drive wheel assembly (36) by the means of motor tension spring (43). This insures the proper friction contact between the motor drive shaft and drive whee (36). The drive wheel (36) is firmly mounted in drive wheel bracket and bearing assembly and is pivoted on bearings at two points eliminating possible latera motion. This reduces the possibility of WOWS. Whe the record changer is in shipment, the entire moto and bracket assembly (66) (65) is fastened to a secon point by motor mounting screw (9). This eliminate the possibility of indentations forming in drive whee (36) as a result of constant pressure and pounding o the motor drive shaft during shipment.

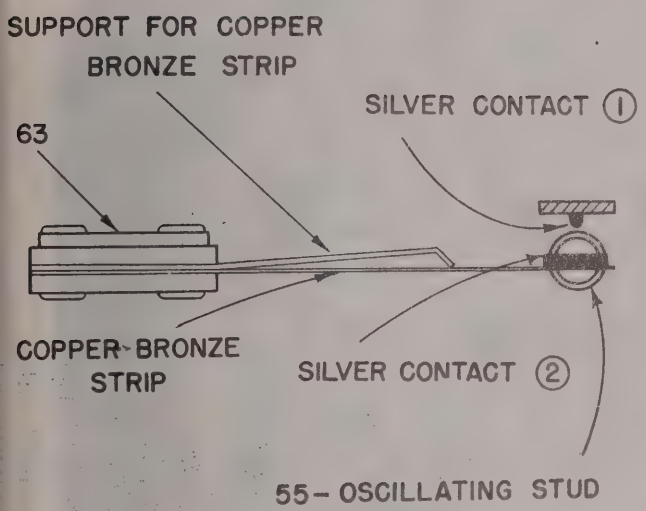


TURNTABLE

There is little possibility of any damage occurring to the turntable through normal usage. However, it is possible the turntable may be removed and dropped, thus damaging pinion and bearing assembly (25) so that it would have to be replaced. Replacement is quite simple. All that is required is to drill out the three rivets (24) on pinion bearing (25). When removing the rivets from the turntable plate or disc, be certain not to excessively disturb the flocking. Then obtain three new rivets (24) and re-rivet pinion bearing assembly (25). If the flocking is scraped or damaged or discolored it can be replaced by spraying the scraped portion with clear lacquer. Dip the entire turntable disc into a box of flocking, then brush off the excess.

TRIP CONTACT ASSEMBLY

For proper automatic rejecting, silver contact #2 on trip switch assembly (63) should be in proper relation to silver contact #1 on friction lever (47). The adjustment should be made with the record changer resting on the side nearest to the idler wheel and trip assembly (36). The turntable should be rotated sufficiently to move oscillating lever stud (55) to its maximum upward travel. The distance between the silver contact #1 on the friction lever (47) and silver contact #2 on trip switch (63) should be 1/16". If the distance is greater or less than 1/16", the support for the copper bronze strip on trip switch assembly (63) should be bent until this 1/16" gap is attained.



Trip Contact Adjustment

LUBRICATION

Additional lubrication should not be required for the life of the changer, but in cases of unusual use or high operating temperatures the changer should be lubricated as follows:

All shoulder rivets which hold moving parts, all stud shoulder mounting points on which moving parts operate and all C washers should be lubricated with a few drops of fine instrument oil.

The other moving surfaces should be coated either with Sta-Put Grease or Sta-Put Oil as indicated in the following two illustrations. The purpose of using the extremely fine instrument oil is its ability to penetrate into the moving metal parts. These saturated materials then act similarly to self-lubricated oilite bearings.

TROUBLE SHOOTING

NEEDLE DOES NOT TRACK ACROSS RECORD PROPERLY

a. Clean foreign material from around needle.

b. Check needle to see if the tip is bent or broken. Replace needle.

c. Hinge bearing binds. Check lateral movement of tone arm. It must move freely without binding.

d. Excessive vibration while playing an LP record. Any vibration cause by (1) unsteady mounting, (2) floor vibration, or (3) passing of heavy vehicles may cause the pickup to glide across the record grooves.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT

a. Check line voltage and frequency.

b. Check lubrication.

c. Motor windings damaged.

d. Room temperature abnormally low.

MOTOR FAILS TO RUN EVEN WHEN IT IS DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING

a. Open windings.

b. Damaged or frozen bearings.

c. Lower rear support bracket bent. Remove and straighten bracket--re-center armature.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES

a. Cabinet tilted.

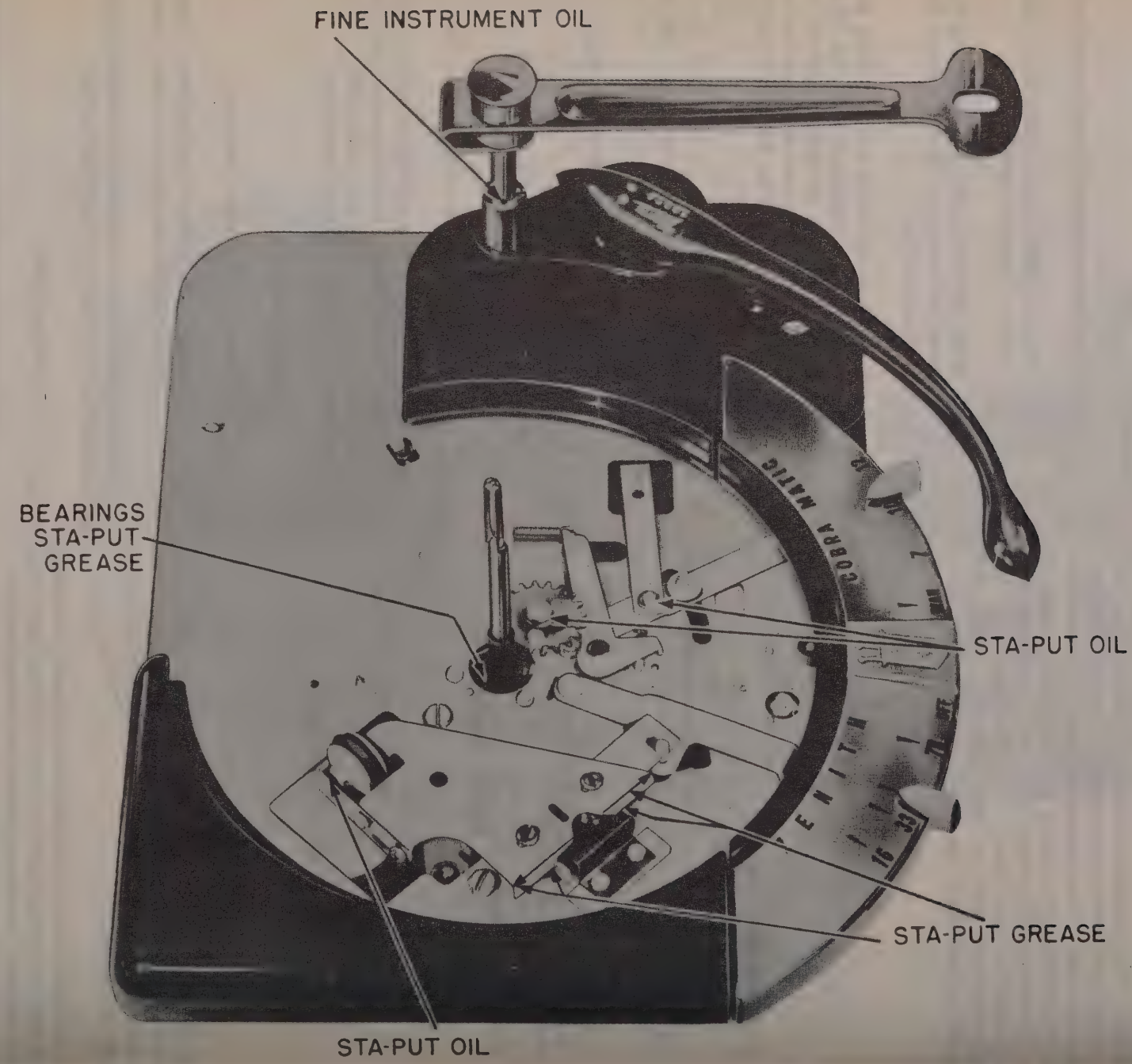
b. Badly worn or broken needle cartridge.

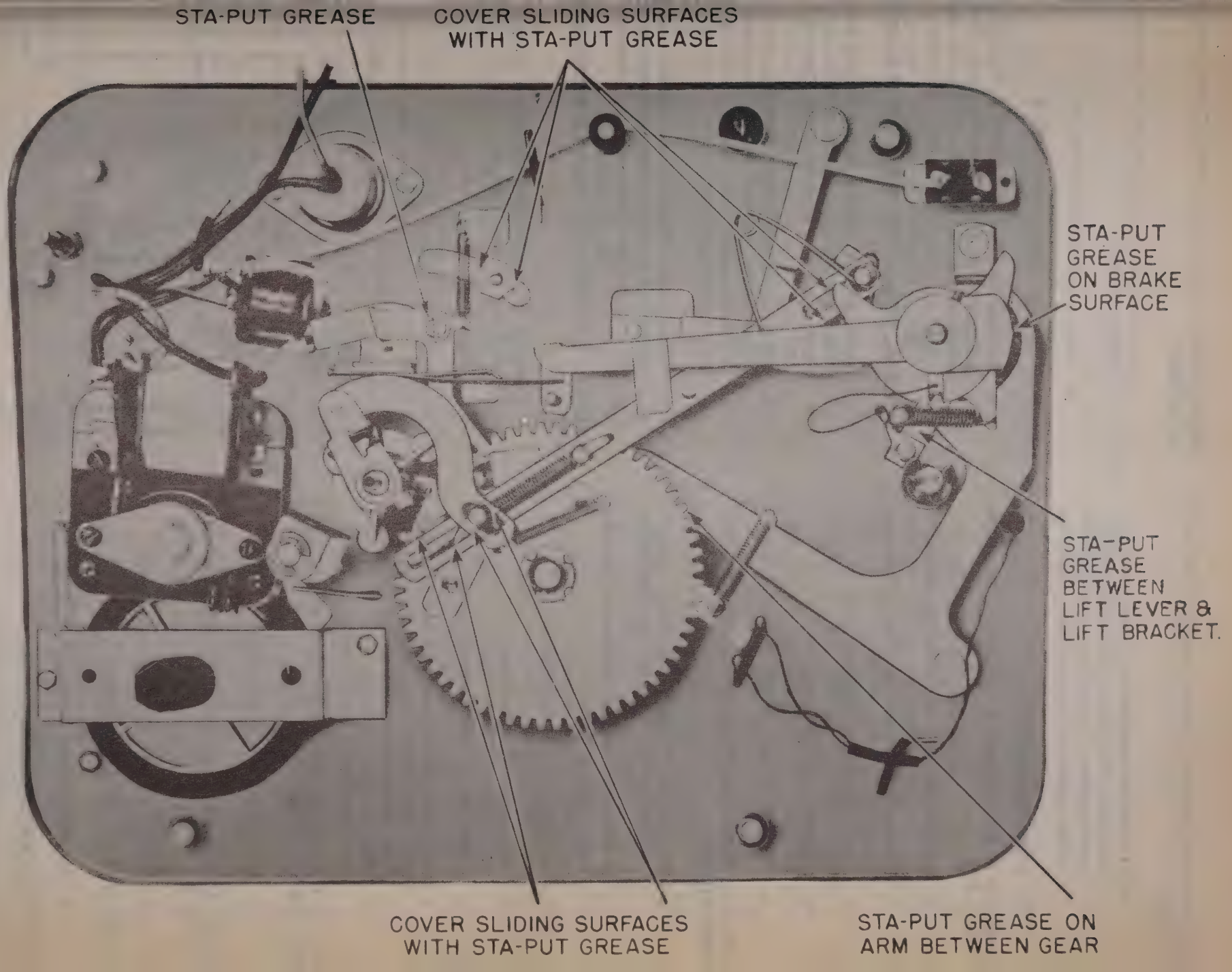
TONE ARM FALLS OFF RECORD

a. Check tone arm set-down adjustment.

b. Check tone arm pivot bracket.

c. Changer not level.


FINE INSTRUMENT OIL
BEARINGS
STA-PUT
GREASE
STA-PUT OIL
STA-PUT GREASE
STA-PUT OIL
COBRA MATIC


STA-PUT GREASE
COVER SLIDING SURFACES WITH STA-PUT GREASE
STA-PUT GREASE ON BRAKE SURFACE
STA-PUT GREASE BETWEEN LIFT LEVER & LIFT BRACKET.
COVER SLIDING SURFACES WITH STA-PUT GREASE
STA-PUT GREASE ON ARM BETWEEN GEAR

SQUEAKS OR NOISES DURING PLAYING OF RECORDS

a. Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.

b. Check lubrication.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES

a. See that the receiver is set for Phono.

b. Check receiver audio by listening to radio.

c. Check the phono oscillator tube.

d. Check needle cartridge.

e. Check tone arm housing for broken leads.

RUMBLE, WOW AND MICROPHONICS DURING REPRODUCTION

a. Changer not "floated" properly. Remove packing strip. Loosen mounting bolts.

b. Motor leads pulled too tight preventing motor from "floating" freely.

c. Noisy phono oscillator tube.

d. Impression on idler wheel.

e. Check rubber motor shock mounts.

f. Check the motor drive shaft and be certain the plane of the shaft's diameter is parallel to the rubber surface of drive wheel assembly (36).

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE

a. Check tone arm height adjustment.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD

a. Check tone arm set-down adjustment.

TONE ARM SET DOWN VARIES

a. Tone arm pivots loose.

CHANGER CONTINUES TO CYCLE

a. Check the trip switch adjustment.

b. Trip pawl sticks.

CHANGER WILL NOT CYCLE UPON COMPLETIO OF RECORD

a. Be certain that the record has an eccentri center groove.

b. Check velocity trip mechanism.

CHATTER OF TRIP PAWL ASSEMBLY

a. Remove mounting bolt which fastens tri pawl assembly (62) to shoulder stud. The load shoulder stud with Sta-Put Grease an replace and fasten trip pawl assembly.

ELECTRICAL NOISE WHEN TONE ARM IS MOVE

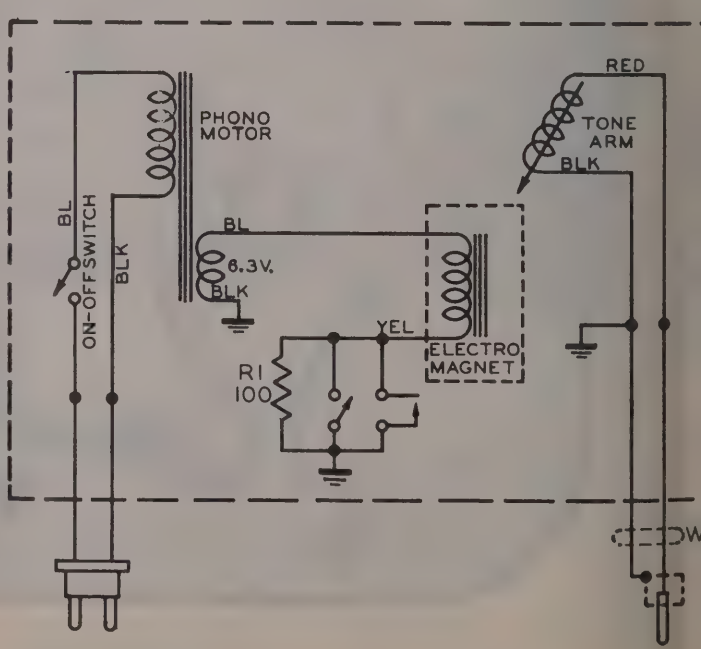
a. Check ground wire from metal tone arm stiffener to ground terminal used to term inate ground wire from the Cobra Cartridge

b. Stud on oscillating lever and stud assembl (55) should be covered with vinylite tubin to prevent contact with friction lever an weight assembly (47).

c. Friction lever (47) at its most outward swin may contact wire guide stud on changer bas plate. Cover this stud with vinylite tubing

FRICTION LEVER (47) FAILS TO MOVE WITH TONE ARM

a. Check felt washer (69) for proper friction surface. If worn, replace.



Wiring Diagram

PARTS LIST

for

S-14028, S-14029, S-14030, S-14031 and S-14036
Variable Speed Record Changers

Tone Arm Assembly

Parts No.	Description	Price
12-1658	Cartridge Retaining Brkt.	.05
69-261	Tone Arm Set-Down Adj. Screw	.02
80-609	Landing Adj. Spring	.03
83-1636	Contact Support Strip	.01
91-1225	Red-Black Tone Arm Wire	.06ft.
112-573	#2-32x1/4 R. H. S.T. (Cartridge Ret. Brkt. Mtg. Screw)	.01
112-619	#2-32x5/16 R.H.S.T. (3 used to Mt. Hinge Plate)	.02
127-68	Cartridge Contacts	.01
127-69	Cartridge Contacts	.01
148-125	Cobra Tone Arm Only	.75
S-15780	Red-Green Cobra Cartridge	3.50
S-16905	Tone Arm Assem. (Complete) (Less Cartridge)	
S-16986	Hinge Plate & Brkt. Assem.	.20

Miscellaneous

6-59	Spindle Bearing	.40
6-61	Compression Spring Bearing	.10
6-64	Tone Arm Bearing	.40
12-1742	Guide Brkt. (Idler Wheel)	.07
15-81	Cap (Spindle)	
23-22	A.C. Connector (used on S-14028-30-31)	.05
24-550	Switch Lead Cover	.10
34-172	Osc. Gear (Part of S-16918)	.05
43-187	Record Post Housing	.70
43-188	Front Housing	.95
43-189	Decorative Housing	.80
46-865	Record Shaft Knob (Gold)	.15
46-866	Reject Switch Knob	.10
46-867	Speed & Record Size Control Knobs (2 Used)	.10
54-280	4-40x3/16x1 1/16" Hex Nut Steel N.P. (used on Lift Pin Assem.)	.01
54-282	Spring Nut (used on Lift Pin Assem.)	.01
56-284	Groove Pin 1/16" dia. (used on S-16913)(or 56-287)	.02
56-285	Groove Pin 3/32" dia.x3/8" lg. (used on S-16927)	.02
57-1613	Emblem Plate	.20
57-1649	Speed Adj. Plate	.20
57-1650	Switch Mtg. Plate	.10
57-1654	Escutcheon	3.00
60-16	Gear Segment Pawl	.10
63-1744	100 ohm 1/2W Ins. Res 20%	.21
64-3	Rivet 1/8 dia.x9/32 lg Tubular (3 used on Turntable)	.01
64-6	Rivet 1/8 dia.x3/16 lg. Tubular (used on S-16912)	.01
64-430	Shoulder Rivet (8 used)	.04
64-431	Shoulder Rivet (used on S-16918)	.20
69-43	8-32x3/8 R.H.M.S. Steel (Mts. S-13913)	.70C
69-262	8-32x1/2" Phill. R.H.M.S. Steel St. Br. (Tone Arm Height Adj.)	.85C
73-99	8-32x1/4" Slab Hd. Set Screw (2 used on S-16908)	.02
73-112	8-32x1/2" Slab Hd. Set Screw (used on 94-723)	.02
73-121	Special Set Screw (Tone Arm & Lift Pin)	.12
73-123	8-32x1/4" Allen Hd. Set Screw (used with 46-865)	.12
73-131	6-32x3/8" Slab Hd Set Screw (used on S-16917)	.03
80-582	Trip Lever Spring (2 used)	.10
80-613	Tone Arm Lift Lever & Motor Tension Spring (2 used)	.10
80-645	Tone Arm Height Adj. Spring	.10
80-698	Gear Segment Pawl Spring	.12
80-807	Spindle Compression Spring (used on S-16913)	.01
80-808	Idler Brkt. Retaining Spring	.08
80-809	Brake Spring	.05
80-810	Idler Wheel Spring	.05
80-811	Tone Arm Swivel Spring	.06
80-812	Tone Arm Link Spring	.06
80-813	Tone Arm Toggle Spring	.05
80-814	Ejector Lever Spring	.05
80-816	Compression Spring (used with S-16922)	.01
83-1574	Two Lug Terminal Strip	.04
85-482	ON-OFF Switch	.40
85-483	Reject Switch	.60
93-53	1/32x11/64x3/8 Steel Washer (used on S-15505)	.01
93-416	1/32 thk.x13/64 I.D. x 5/8O.D. (used on Motor Mtg.)	.02
93-781	#8 Split Lockwasher Steel N.P. (used on S-13913)	.23C

Diag. No.	Parts No.	Description	Price
	93-784	Spring Washer (used on 94-722)	.03
	93-876	Fibre Washer (used on S-13913)	.02
67	93-900	Fibre Washer (3 used on Motor Mtg.)	.60C
	93-903	Steel Washer (3 used on motor Mtg.)	.01
	93-968	.046 thk x .171 I.D. x 1/2" O.D. Steel Washer (used on 94-722)	.01
69	93-1055	Felt Washer (used on S-16910)	.02
	93-1056	Felt Washer (used on Idler Wheel)	.02
	93-1070	Bearing Washer (2 used on 6-59)	.07
	93-1071	Bearing Washer (2 used on 6-64)	.07
64	94-722	Friction Bushing	.15
70	94-723	Friction Lever Retaining Bushing (used on S-16910)	.30
38	97-391	Motor Mtg. Stud	.70
55	97-393	Osc. Lever Stud	.03
	112-544	Record Changer Mtg. Screw	.11
35	112-804	Compression Spring Retaining Screw (used on S-16922)	.18
	112-805	4-40x1/2" Truss Hd. W. S. Steel Stat Br. (2 used to Mt. 85-483)	.01
	112-806	#4x3/8" Binding Hd S.T. Screw (1 used on ea. 46-867)	.03
	113-9	8-32x1/4 Hex Hd Sl. M.S. (1 ea. used on S-15505 & 94-722)	.02
8	114-217	#8x1/4" Hex Hd. Sl. S.T. (7 used)	.75C
	114-248	6-20x5/16" Hex Hd. Sl. S. T. (2 used 43-187 & 189 - 3 Used 43-188)	.01
	114-297	#6x1/4" Hex Hd. Sl. S. T. Screw (2 used 85-482 & 1 used on 83-1574)	.01
9	114-345	10-32x3/8" Hex Hd. Sl. M.S. Steel (used on Motor Mtg.)	.02
74	114-347	#8-32x3/8 Hex Hd. (2 used on S-16919)	.03
	114-348	8-32x5/16 Hex Hd. S. T. (3 used on S-16913 & 2 used 199-134)	.06
	114-357	#10-32x3/8 Hex Hd. Sl. M. S. Red Finish (used on Motor Mtg. in Shipping)	.03
46	117-145	Tone Arm Lift Lever	.50
15	118-58	Set Up Link	.08
68	125-61	Rubber Grommet (3 used on Motor Mtg.)	.03
	135-16	Tone Arm Lift Pin Weight	.15
65	141-129	Motor	7.50
65	141-131	Motor 50-60 cycle export	

Diag. No.	Parts No.	Description	Pr
	184-14	1/8" dia. Steel Ball	.
	188-128	Retaining Ring (9 used)	.
	188-131	Retaining Ring (used on Motor Mtg.)	.
	188-137	Retaining Ring (used on pressure arm & shaft Assy.)	.
	188-140	Retaining Ring (used on Clutch Gear Assem.)	.
1	199-134	Record Pressure Arm Shaft Sleeve	.
61	S-13913	Magnet Coil Assem.	.
62	S-15505	Trip Pawl Assem.	.
51	S-16900	Discriminator Lever & Stud Assem.	.
18	S-16901	Speed Change Lever & Stud Assem.	.
17	S-16902	Set-Up Change Lever & Stud Assem.	.
53	S-16903	Actuating Lever & Pin Assem.	.
	S-16904	Tone Arm Brkt. & Lift Pin Assem.	.
52	S-16907	Tone Arm Shaft Assem.	1.
49	S-16908	Tone Arm Lever & Bushing Assem.	.
47	S-16910	Friction Lever & Weight Assem.	.
40	S-16911	Brkt. & Stud Assem. (used on S-16912)	.
41	S-16912	Clutch Gear Assem.	.
39	S-16913	Gear Housing & Sleeve Assy.	.
59	S-16917	Ejector Lever & Link Assy.	.
19	S-16918	Osc. Gear & Lever Assem.	.
21	S-16919	Idler Wheel Brkt. & Shaft Assy.	.
5	S-16921	Idler Wheel Assem.	.
36	S-16922	Drive Wheel Assem.	1.
37	S-16923	Drive Wheel Brkt. & Bearing Assem.	.
66	S-16924	Motor Mtg. Plate & Stud Assy.	.
14	S-16927	Pressure Arm & Shaft Assy.	1.
25	S-16929	Turntable Pinion & Bearing Assem.	.
26	S-16930	Turntable Assem. (Complete)	2.
63	S-16933	Trip Switch Assem.	.
48	S-17166	Brake Lever Assem.	.
56	S-17391	Tone Arm Link & Stud Assy.	.
72	S-17424	Spindle Assem. (Complete)	
		S-14029	
	S-17028	Plug & Shielded Lead Assy. (Plug 58-75)	.
	S-17029	Plug & Wire Assy. (Plug 58-192)	.
		S-14030	
	S-17068	Cable & Plug Assy. (Plug 58-166)	1.

Diag. No.	Parts No.	Description	Price
		S-14031	
	S-16940	Twisted Wire & Plug Assy. (Plug 58-75)	.30
	S-16988	Plug & Wire Assy. (Plug 58-192)	.35
		S-14036	
	S-17028	Plug & Shielded Lead (Plug 58-75)	.80
	S-17029	Plug & Wire Assem. (Plug 58-192)	.35
	23-22	A-C Connector	.04

THE ROYALTY OF RADIO

Model S14032 Three Speed Record Changer

TONE ARM ASSEMBLY

Part No.	Description	Price
VM724	Ball Bearing 1/8" Dia. (6 used)	.03
VM1574	Adj. Ring Spring	.20
VM1580	Adj. Screw (2 used)	.20
VM1840	Adj. Ring Assembly	1.60
VM2310	Pivot Screw (2 used)	.10
VM2881	Hinge & Brkt. Assy.	6.60
VM3014	Complete Tone Arm & Hinge Assy. (Less Cartridge)	6.40
VM3059	Bearing Spacer (For VM 724 bearings)	.15
VM3093	Socket & Strengthener Assy.	1.00
112-619	#2x5/16" R.H.S.T. Screw (3 used)	.02
148-117	Tone Arm Shell (only)(3012)	1.25
S-15780	Red & Green Cobra Cartridge	3.50

MISCELLANEOUS MECHANICAL PARTS

Part No.	Description	Price
VM419	Spring (Cam Assy.)	.25
VM1512	Hinge Bearing Assy.	2.00
VM1513	Lift Rod Assy.	.45
VM1519	A.C. Switch Assy. (only)	1.35
VM1522	Set Down Locater Assy.	1.35
VM1547	Drive Pin (Cam Assy.)	.04
VM1581	Index Cam	.25
VM1583	Catch Spring	.30
VM1588	"C" Washer	.04
VM1595	Cut-Off Rod	.25
VM1596	Cut-Off Rod Retaining Pin (2 used)	.06
VM1599	Cut-Off Rod Tension Spring	.06
VM1610	Set Screw	.20
VM1616-B	Set Down Heigh Adj. Screw	.04
VM1620	Conical Spring (used on VM1513)	.03
VM1631	Locator	.10
VM1637	Fibre Washer (1/64" Thick)	.04
VM1638	Safety Spring (used on VM1522)	.10
VM1650	"C" Washer (Lift Rod)	.03
VM1651	"C" Washer (Main Cam)	.04
VM1652	"C" Washer (Control Crank)	.04
VM1653	Fibre Washer	.04
VM1685	Motor Fastener (3 used)	.10
VM1687	Spring Guide	.04
VM1711K	Knob (used on VM1799N)	.45
VM1721	Reject Spring	.15
VM1731	Reject Spring	.15
VM1737	A.C.Switch Cover	.25
VM1799N	Record Support Assy. (Complete)	2.80
VM1922	Fibre Washer (3/64" Thick)	.04
VM2054K	Reject On-Off Knob (Control Knob)	.70
VM2078	Retaining Ring	.10
VM2110	"C" Washer (used on VM1799N)	.03
VM2198K	Speed Knob	.60
VM2275	#4x1/4" Hex Screw	.04
VM2338	Cam Silencer Wire	.10
VM2354	Speed Control Shaft Bearing	.20
VM2388	Wire Spring (Cam Assy.)	.10
VM2425	Control Lever Assy.(Complete)	3.00
VM2493	Spring & Chain Assy.	.75
VM2516	Spring Washer	.06
VM2583	Fibre Washer	.02
VM2624	Bearing	.75
VM2639	Turntable Washer	.30
VM2643	Index Lever	.25
VM2648	Set-Down Locater Plate	.20
VM2661	Hairpin Clip	.03
VM2760	Trip Lever	.20
VM2764	Reject Rod	.20
VM2765	Rubber Grommet (2 used)	.05
VM2789	Cam Locator	.25
VM2790	Trip Link	.45
VM2792	Trip Link Support	.05
VM2795	Trip Pawl Assy.	.70
VM2796	Cam Gear Assy.	3.15
VM2823	Index Rod	.20
VM2829	Fibre Washer	.04
VM2834	Speed Control Crank	.40
VM2835	Shaft & Arm Assembly	.60
VM2885A	Turntable Assy. (Complete)	6.75
VM2887	Lift Arm Assy. (Complete)	3.50
VM2891	Locator Housing & Lift Rod Assy.	4.50
VM3006	Armature Return Spring	.20
VM3015K	Tone Arm Rest	.30
VM3016	Armature Brkt. Assy.	.20
VM3091	Speed Esc.	.60
VM3092	Base Plate Assy.	12.00
VM3114	Spindle & Bearing Assy. (Complete)	13.50
VM3134	Inserts	.35
VM3174	A.C. Switch & Cable Assy.	4.00
VM3240	Shut Off Brkt.	.15
VM3241	Cotter Pint to Mount VM3240)	.02
VM3252	Cam Silencer Wire (Heavy Gauge Wire)	.15
VM3532A	New Turntable (Series "B")	6.75
VM3534	New Cam & Trip Pawl Assy. (Series "B")	3.15
VM3630G	Turret Phono Motor Assy.	17.50
22-1914	.047 Mfd. (Molded) 400V	.35
32-26	Drive Belt (2 used)	.20
61-125	Idler Wheel (use G21771)	.75
63-1778	680 ohm 1/2W Ins. Res.	.21
69-275	Shipping Bolts	.02
80-829	50 Cycle Adapter Spring	.12
S-13913	Solenoid Assembly	.65

Part No.	Description	Price

Model S14033 & S14034 Three Speed Intermixer Record Changers

S-14033 supercedes S-14025 and S.14034 supercedes S-14027. The S.14033 and S-14034 use a three-speed turret motor assembly, whereas the S-14025 and S-14027 use a belt driven motor assembly.

OMIT:

32-26	Drive Belt	
VM2727C	Motor Assembly	

ADD:

VM3129	Motor Assembly	17.50
VM3139	Turret Bushing (Drive Pulley) 78 R.P.M.	1.50
VM3140	Turret Bushing (Drive Pulley) 45 R.P.M.	1.50
VM3141	Turret Bushing (Drive Pulley) 33-1/3 R.P.M.	1.50

ZENITH
REG. U. S. PAT. OFF.
LONG DISTANCE RADIO
REG. U. S. PAT. OFF.

HOUSEHOLD RECEIVER SERVICE BULLETIN NUMBER 5

CHASSIS NO. 4E41, 6E02, 6E02Z, 6E40, 7E01, 7E01Z, 7E02Z, 7E22, 8E20, 9E21, and 9E21Z.

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

Printed in U.S.A.

25M—11-48—CPC

HOUSEHOLD SERVICE BULLETIN NO.5

MODEL 4G800
CHASSIS 4E41

BATTERY DRAIN

The On-Off switch #85-433 does not completely break contact on some receivers when the lid is closed. To correct this condition, saw one plastic switch knob 46-736 into 1/16 " lengths and place one on switch shaft as illustrated. This will force switch down far enough to break contact and disconnect the batteries when the receiver is not in use. See Fig. 1.

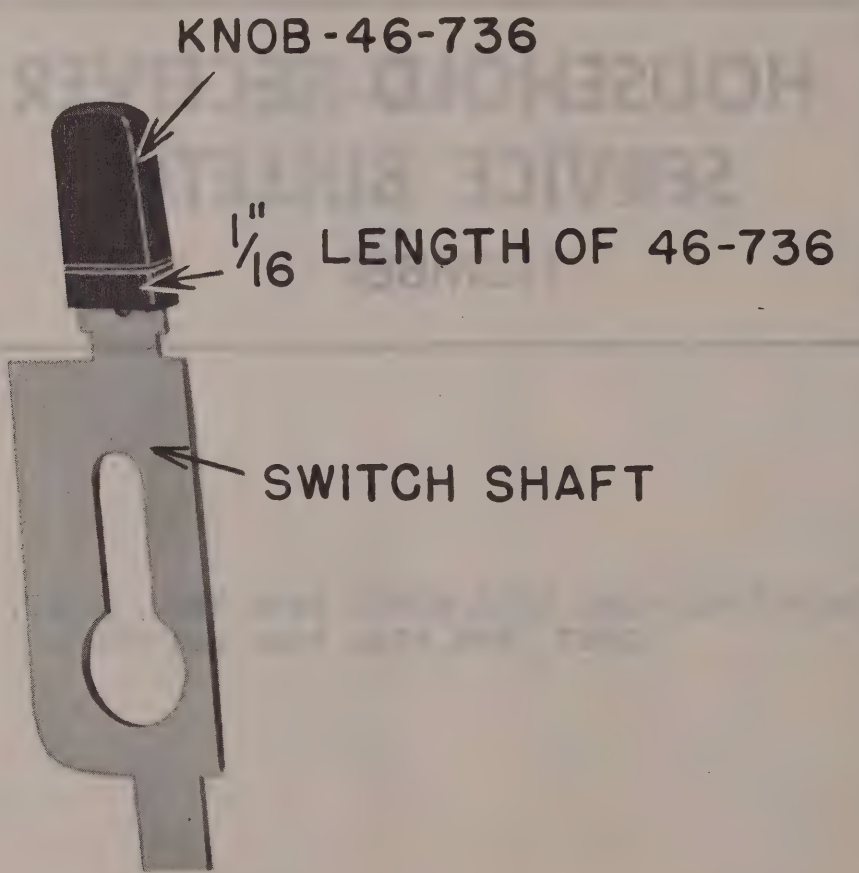


Fig. 1 On-Off Switch Showing Knob Extension Section

HUM

In some cases the calibration pointer touches the metal front of the cabinet, thus putting the gang at an AC potential. To correct this condition place a fibre washer #93-323 between the pointer and the metal dial front. This fibre washer between the metal front panel and the dial pointer, completely prevents this "shorting" condition. See Fig. 2.

In very rare cases, when hum is encountered and cannot be corrected in any other manner, we suggest changing the 1S5 tube. Sometimes this tube breaks down internally and hum results.

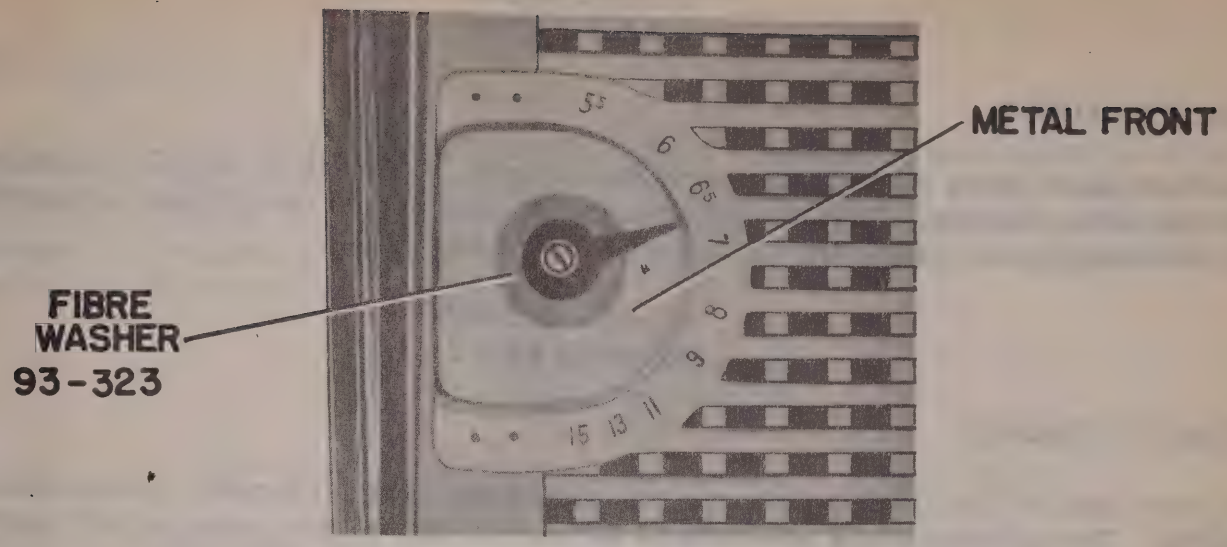


Fig. 2 Position of Insulating Washer

TUBE COMPLEMENT

On later runs the 3Q4 tube was replaced with a 3V4 tube. The circuit remains the same in this case. However, the wiring to the tube base has been altered. The 3Q4 is not interchangeable with the 3V4 because of socket connections.

CUTOUT

In some cases when the front lid of the receiver is open, the receiver will cut in and out or sometimes be entirely dead. The wire from the wavemagnet to the front door hinge may break at the hinge connection. To correct this condition, remove the handle and resolder these leads, being quite certain that solder is not allowed to run back on the antenna lead and that enough extra antenna lead is allowed for flexing to prevent breakage when the door is open. See Fig. 3.

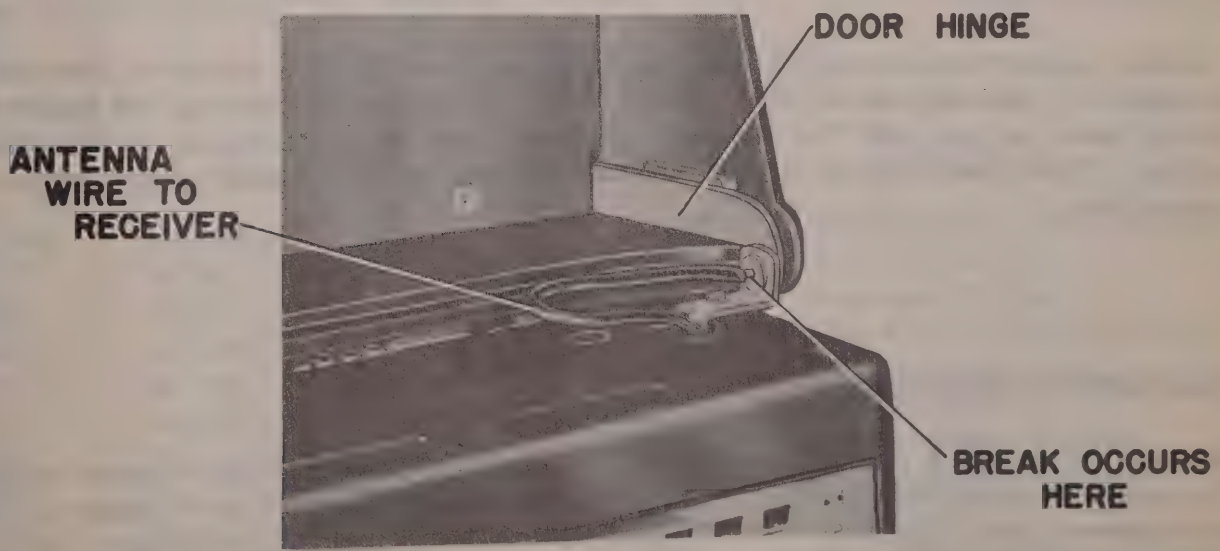


Fig. 3 Wavemagnet Hinge Connection

MODEL 6R886
CHASSIS 6E02

MICROPHONICS

In some cases when microphonics are encountered, replacing of the 6C4 mounted at the top of the chassis, alleviates this condition. The 6C4 is easily made accessible by removing the screen in the record changer compartment.

MODEL 6R886Z
CHASSIS 6E02Z

CIRCUIT CHANGE

In later runs of the 6E02, a tone control was added and the chassis number became 6E02Z. The additions and deletions to the circuit due to this tone control addition are all included in the diagram contained herein. See Page 519.

ADDED PARTS LIST FOR THE 6E02Z.

Part No.	Description	Part No.	Description
S-14667	Dial Pointer & Pulley Assy.	63-1653	Tone Control
S 14670	Tone Control Brkt & Lug Assy.	78-793	Socket-Octal Tube
12-1490	Cover Plate Support	85-438	Phono-Radio Switch
22-827	.1 MFD. 200 V.	125-66	Rubber Grommet
46-688	Tone Control Knob	166-41	Rubber Bumper
57-1398	Escutcheon	188-34	Retaining Ring

MODEL 6G801
CHASSIS 6E40

MICROPHONICS

In some cases when microphonics are encountered in this receiver they can be eliminated by replacing one or more of the tubes. The offending tube can be located by turning your set on with the volume advanced and the set tuned to an off-station position. Then gently tap each tube, the one that emits the loudest "ping" is the defective item.

MODEL 7H820
CHASSIS 7E01

COMPONENT CHANGES

On some of the later run 7E01 chassis, the wax by-pass condensers were replaced with molded condensers. In case any of these molded condensers are required, their part numbers are as follows: 22-1778 .047 Mfd. 200 volt molded condenser - 22-1750 .022 Mfd. 600 volt molded condenser - 22-1754 .0022 Mfd. 600 volt molded condenser - 22-1809 .01 Mfd. 200 volt molded condenser - 22-1810 .1 Mfd. 200 volt molded condenser - 22-1811 .0047 Mfd. 400 volt molded condenser.

MODEL 7H820Z
CHASSIS 7E01Z

BAND COVERAGE

On the 7E01Z the 45 megacycle FM bnad has been removed. The receiver now has the broadcast band and the 100 megacycle FM band only. The new schematic and parts list contained herein, give a complete explanation as to its operation. Balancing procedure is the same as for the 7E01. See Page 82. However, the procedure for balancing the 45 megacycle band is omitted.

ADDED PARTS LIST FOR THE 7E01Z

Part No.	Description	Part No.	Description
22-1775	.047 MFD. 400 V.	83-1545	Insulating Strip
22-1778	.047 MFD. 200 V.	85-443	Bandswitch
22-1809	.01 MFD. 200 V.	93-690	Felt Washer
22-1810	.1 MFD. 200 V.	93-719	.031 x 3/16" x 7/16" Steel Washer
22-1811	.0047 MFD. 400 V.		
22-1813	.022 MFD. 600 V.	93-961	Ins. Shoulder Washer
22-1814	.0022 MFD. 600 V.	114-160	6x7/8"Hex.Hd.S.T.Screw
58-128	Two Prong Plug	114-277	8-32x9/16" Hex.Hd.M.S.
74-52	Plastic Speaker Screen	202-671	Instruction Book

MODEL 7H822Z
CHASSIS 7E02Z

CIRCUIT CHANGE

On the 7E02Z receiver a tone control and a neon bulb (on-off indicator) have been added. Page 517 shows all circuit additions and deletions and the added parts list shows all the new components included in this receiver. Balancing procedure is the same as for the 7E02. See Page 84.

ADDED PARTS LIST FOR CHASSIS 7E02Z

Part No.	Description	Part No.	Description
12-1546	Indicator Socket Brkt.	63-1884	220K Ohm Ins. Res. 20% 1/2 W.
14-857	Model 822Z Plastic Cab.	63-2008	Tone Control
14-858	Model 822WZ Plastic Cab.	78-585	Indicator Socket
22-1025	.15 MFD. 200 V.	80-402	Dial Cord Tension Spring
22-1511	50 MMFD. Ceramic 500 V.	83-1593	Felt Strip (2 used)
26-419	Dial Scale	83-1595	Spacer Strip
46-769	Tuning & Vol.Con.Knob	93-961	Ins. Shoulder Washer
46-770	Band Switch Knob	100-105	Neon Indicator Bulb
46-780	Tone Control Knob	199-35	Dial Scale
46-781	Tone Control Knob	202-687	Instruction Book
63-1744	100 Ohm Ins. Res. 20% 1/2W.	S-15325	Cab. Back & Plug Cover Assy.

MODEL 7R887
CHASSIS 7E22

OSCILLATION

When replacing defective or burned out tubes in this receiver, care must be taken that the IF amplifier, 6SK7 be replaced only with another 6SK7. Use of 6SK7 GT or G will result in extreme oscillation which can be controlled only by the use of the 6SK7 metal tube.

MODEL 8H832
CHASSIS 8E20

SPEAKER REPLACEMENT

If replacement of one of the speakers is required, care should be taken when connecting the new speaker in the circuit so the speakers are properly phased. Whether or not the speakers are in phase can be determined by listening to the receiver. If the speakers are out of phase all bass notes will be absent and also distortion will be very dominant. This condition can be corrected by reversing the voice coil wires on the newly replaced speaker.

MODEL 9H881-2-5-8
CHASSIS 9E21

WEAK SIGNAL

If the C-4 .05 condenser in series with the wavemagnet is open, the signals will be weak and the addition of an external antenna will not appreciably improve signal strength. The replacing of this condenser with a new .05 usually clears up the trouble.

PHONO DEAD

Check resistor R-14, 10,000 ohm 1/2 watt for intermittent operation. Due to movement of the RF shelf when the band switch is operated, this resistor sometimes becomes intermittent thus opening up the phono circuit.

ALIGNMENT - CAUTION

In most cases it is not necessary to change or make any alterations in the IF or discriminator trimmers in this receiver. They are quite stable and the only change in alignment recommended is that of the RF section.

DIAL DRIVE BINDING

Be quite sure to dress the tone control wires away from the pulley and dial string. If these are not dressed away, binding and dial slipping will result.

STATIC WHEN TUNING

If, when tuning in a station, static is prevalent, check and see if the silver foil on the paper tube shield is tightly wrapped on the cardboard form. Sometimes this foil unwraps from the cardboard form and lays against the gang plates, creating this static.

BAND COVERAGE

On the 9E21Z the 45 megacycle FM band has been removed. The receiver now has the broadcast band and the 100 megacycle FM band only. New circuit and parts list contained herein, give a complete explanation as to its operation. Balancing procedure is the same as for the 9E21, however, the procedure for balancing the 45 megacycle band can be omitted. See Page 102.

ADDED PARTS LIST FOR THE 9E21Z

Part No.	Description	Part No.	Description
26-418	Dial Scale	85-447	Band Switch
93-721	Black Felt Washer	125-26	Rubber Grommet
S-15394	Dial Scale & Strip Assy.	112-533	6x1/4 Phill.R.H.S.T.Screw
22-1418	0.1 MFD. 200 V.	57-1471	Dial Escutcheon
22-1489	10 MMFD. (Ceramic)500V.	78-798	Seven Contact Socket
22-1505	17 MMFD. (Ceramic)500V.	80-423	Chassis Lift Spring
22-1884	2 Section Elect. 40 MFD.	83-1246	Record Changer Trim Strip
	350V-40MFD. 450 V.	112-611	Record Changer Mtg. Screw
63-1198	10K Ohm Ins. Res. 10% 2W.	159-61	Plug Button
63-1911	1 Megohm Ins. Res. 10% 1/2W	196-109	Dial Dust Gasket
63-1970	3300 Ohm Ins. Res.20% 2W.	202-686	Instruction Book
11-108	Line Cord & Plug	S-14009	Dual Spd.Intermixer Rec.Chgr.
57-1269	I.F. Trans. Terminal Plate	S-14306	Interconnecting Cable Assy.

POLISH FOR WOOD CABINETS

Zenith offers a perfect polish for all lacquer and varnish finishes and especially recommended for use where a high gloss finish is desired. Will not show fingerprints. Easy to apply. Adds long life and beauty to all furniture and woodwork.

ANTI-STATIC POLISH AND CLEANER FOR ALL PLASTICS

This Zenith product is particularly useful on plastic dial crystals because of its anti-static properties which prevent clouding and attraction of dust and dirt. Excellent for cleaning Microgroove (long play) and other high quality phonograph records.

ZENITH SCRATCH STICK

In cases where cabinets are accidentally scratched or marred, Zenith offers an easy to use scratch remover with built in dauber. Designed for use on walnut and dark finish cabinets.

INSTRUCTIONS FOR CONNECTING ANTENNA TRANSFORMER 95-1127 TO ZENITH RECEIVERS.

On receivers using normal high impedance wavemagnets, proceed as follows:

1. Disconnect the wavemagnet from the receiver.
2. Substitute the secondary of the antenna transformer at points where the wavemagnet connections were removed, green wire to grid connection and brown wire to AVC connection. (See Fig. 4)
3. Connect blue primary wire to an external antenna.
4. Connect black primary wire to a good external ground.
5. Align the antenna transformer by following the instructions outlined in the alignment procedure.

On receivers using a low impedance wavemagnet wherein a loading coil is in series with the wavemagnet, the connections are as follows:

1. Disconnect the wavemagnet.
2. Disconnect loading coil.
3. Remove 10-12 MMFD. gang shunt capacitor (this is necessary in order to resonate the 1400 Kc. trimmer in the antenna transformer).
4. Connect green wire from antenna transformer to the grid input side of the antenna section of the gang capacitor. (See Fig. 5)
5. Connect brown wire to AVC line and bypass it to ground with a .05 MFD. capacitor. (See Fig. 2)
6. Blue wire goes to an external antenna and black wire goes to ground.
7. Align the antenna transformer by following the instructions outlined in the alignment procedure.

ALIGNMENT PROCEDURE					
Operation	Connect Osc. To.	Input Sig. Frequency	Set Dial To	Procedure	Purpose
1	One turn loop loosely coupled to blue lead on ant. trans.	600 Kc.	600 Kc.	Adjust L1 to resonance	Align antenna transformer.
2		1400 Kc.	1400 Kc.	Adjust C1 to resonance	

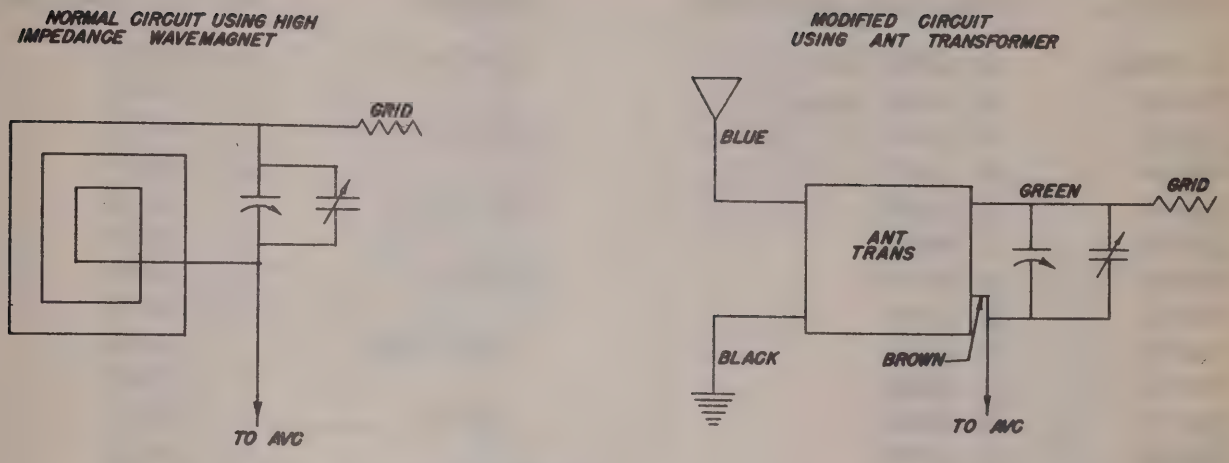

NORMAL CIRCUIT USING HIGH IMPEDANCE WAVEMAGNET
GRID
TO AVC
MODIFIED CIRCUIT USING ANT TRANSFORMER
BLUE
ANT TRANS
GREEN
GRID
BLACK
BROWN
TO AVC

Fig. 4

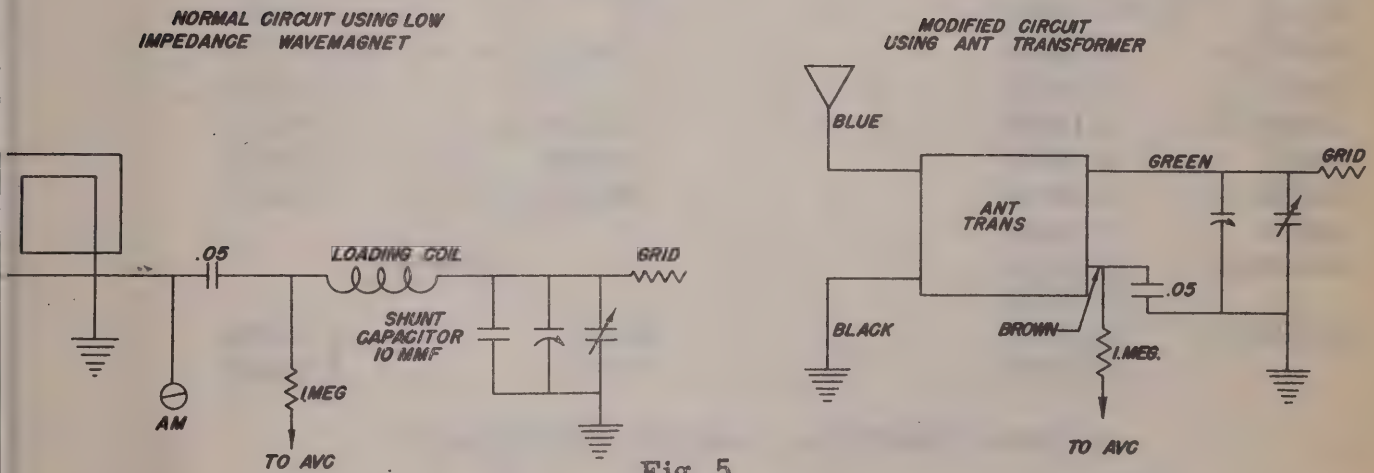
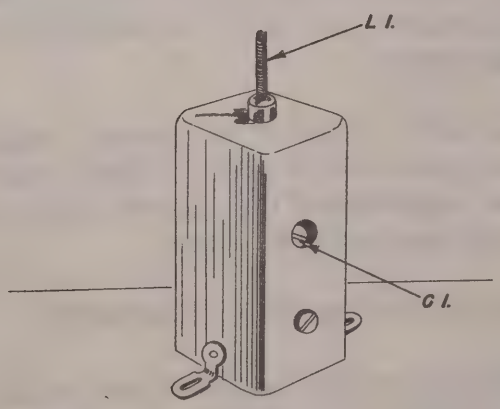

NORMAL CIRCUIT USING LOW IMPEDANCE WAVEMAGNET
.05
LOADING COIL
GRID
SHUNT CAPACITOR 10 MMF
AM
1MEG
TO AVC
MODIFIED CIRCUIT USING ANT TRANSFORMER
BLUE
ANT TRANS
GREEN
GRID
.05
BLACK
BROWN
1 MEG.
TO AVC

Fig. 5


L I.
C I.

1946, 1947 and 1948 Zenith Radio Phonograph Combinations and types of Record Changers used.

MODEL	RECORD CHANGERS
S 12600	S 12650 (Player)
5R080	S 11302 (Player)
5R086	S 11468
6R084	S 11468
6R087	S 11468
6R880	S 14007
6R886	S 14001
7R070	S 13200
7R887	S 14004
9H079	S 11680
9H081	S 11680
9H082	S 11680
9H088	S 11680
9H881	S 14002
9H981LP	S 14009
9H882	S 14002
9H883LP	S 14009
9H885	S 14002
9H985LP	S 14009
9H888	S 14002
9H988LP	S 14009
12H090	S 11680 S 14006 S 14008

MODEL	RECORD CHANGERS
12H990LP	S 14010
12H091	S 11680 S 14006 S 14008
12H991LP	S 14010
12H092	S 11680 S 14008 S 14006
12H992LP	S 14010
12H093	S 11680 S 14006 S 14008
12H993LP	S 14010
12H094	S 11680 S 14006 S 14008
12H994LP	S 14010
14H789	S 13675
14H989LP	S 14011

EXPORT

6S071	S 11970
9S076	S 11680

FORMING RECORD CHANGER TRIM STRIPS

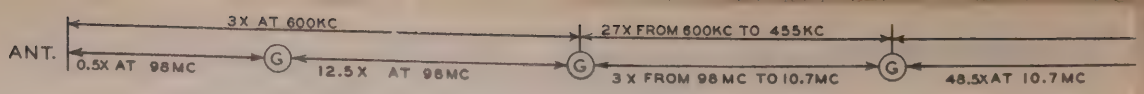
To replace plastic trim strips on the bottom of record changers, it is necessary to have these plastic strips remain in position without undue stress. This can be accomplished by heating this plastic with a 100 to 300 watt infra red heating lamp, and can be done in the following manner.

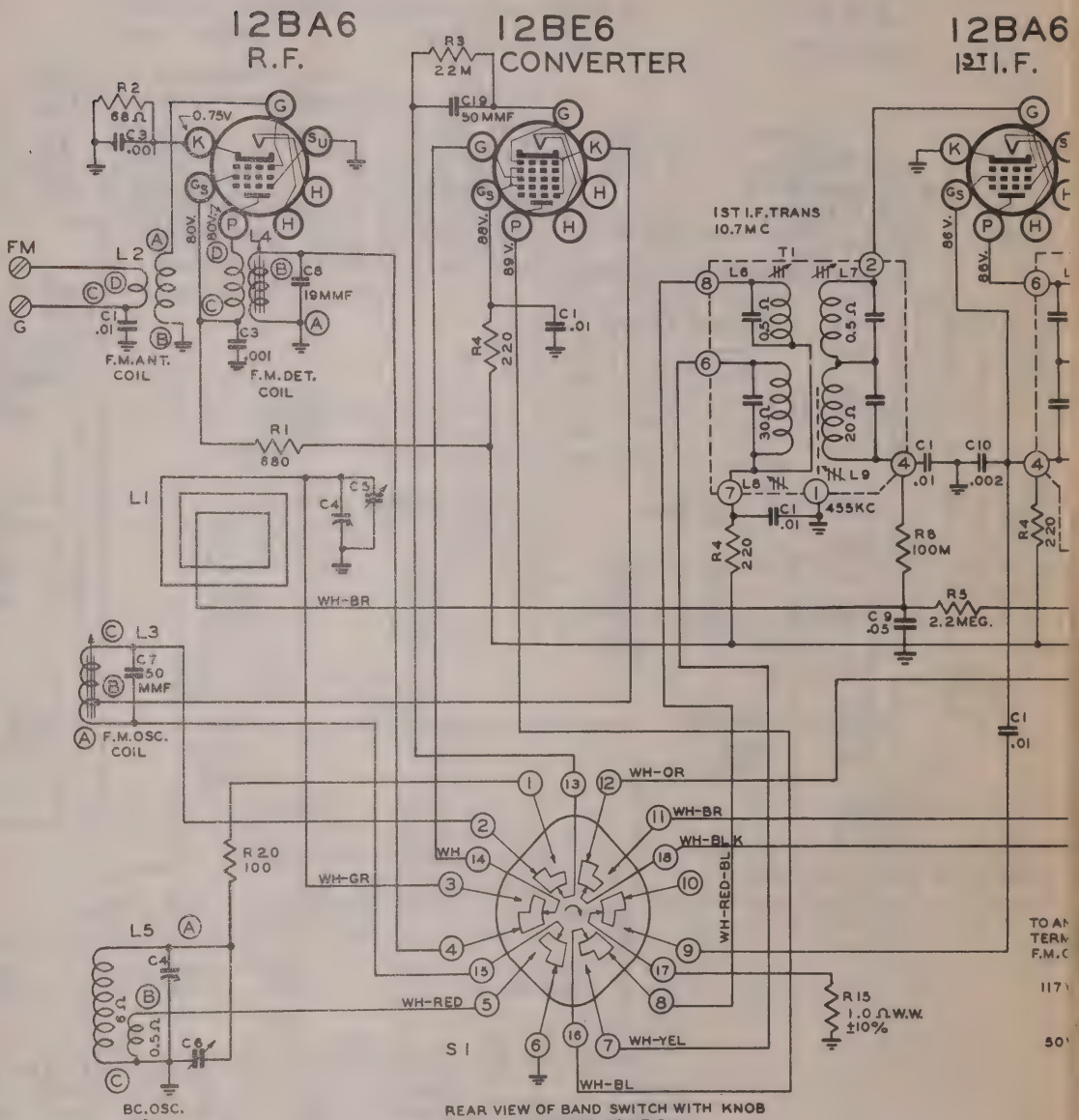
Place the trim strip on the bottom edge of the record changer, bending it to conform with the record changer and then hold it over the heat lamp until it becomes pliable; with fingers, form this to the curvature of the record changer corners. After removing this heat lamp the plastic will remain in this shape.

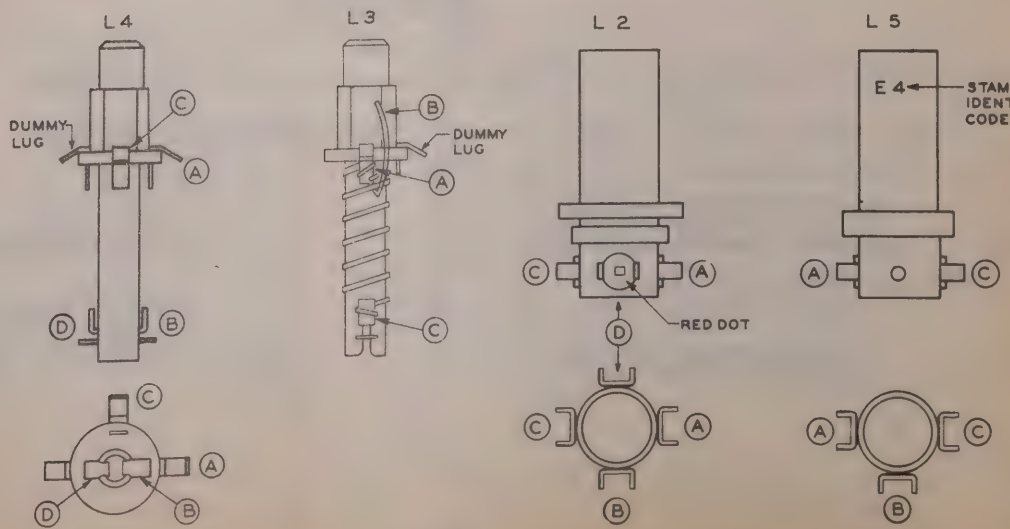
THE CARE OF PLASTIC CABINETS

It is imperative that these polystyrene cabinets not be left in a confined area where the temperature will rise above 150^{o}, as these conditions will damage the cabinets. The result will be warping and shrinkage.

They should not be exposed to exterminating gas of the chlorinated hydro-carbon variety inasmuch as this will completely destroy the velvet finish.







Diag. No.	
C1	2
R1	6
R2	6
A1	S-
A2	S-

1946, 1947 and 1948 Zenith Radio Phonograph Combinations and types of Record Changers used.

MODEL	RECORD CHANGERS
S 12600	S 12650 (Player)
5R080	S 11302 (Player)
5R086	S 11468
6R084	S 11468
6R087	S 11468
6R880	S 14007
6R886	S 14001
7R070	S 13200
7R887	S 14004
9H079	S 11680
9H081	S 11680
9H082	S 11680
9H088	S 11680
9H881	S 14002
9H981LP	S 14009
9H882	S 14002
9H883LP	S 14009
9H885	S 14002
9H985LP	S 14009
9H888	S 14002
9H988LP	S 14009
12H090	S 11680 S 14006 S 14008

MODEL	RECORD CHANGERS
12H990LP	S 14010
12H091	S 11680 S 14006 S 14008
12H991LP	S 14010
12H092	S 11680 S 14008 S 14006
12H992LP	S 14010
12H093	S 11680 S 14006 S 14008
12H993LP	S 14010
12H094	S 11680 S 14006 S 14008
12H994LP	S 14010
14H789	S 13675
14H989LP	S 14011

EXPORT

6S071	S 11970
9S076	S 11680

FORMING RECORD CHANGER TRIM STRIPS

To replace plastic trim strips on the bottom of record changers, it is necessary to have these plastic strips remain in position without undue stress. This can be accomplished by heating this plastic with a 100 to 300 watt infra red heating lamp, and can be done in the following manner.

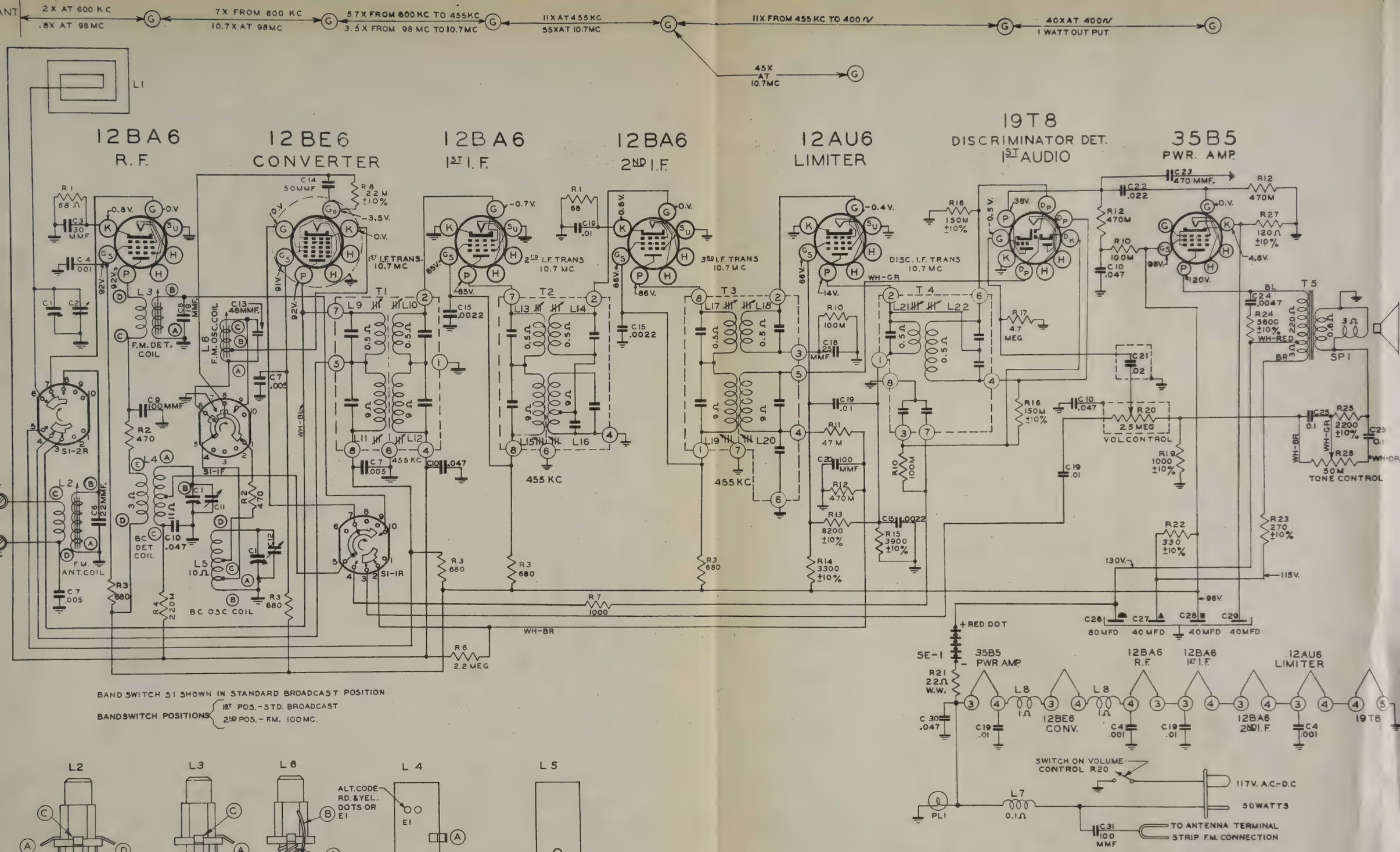
Place the trim strip on the bottom edge of the record changer, bending it to conform with the record changer and then hold it over the heat lamp until it becomes pliable; with fingers, form this to the curvature of the record changer corners. After removing this heat lamp the plastic will remain in this shape.

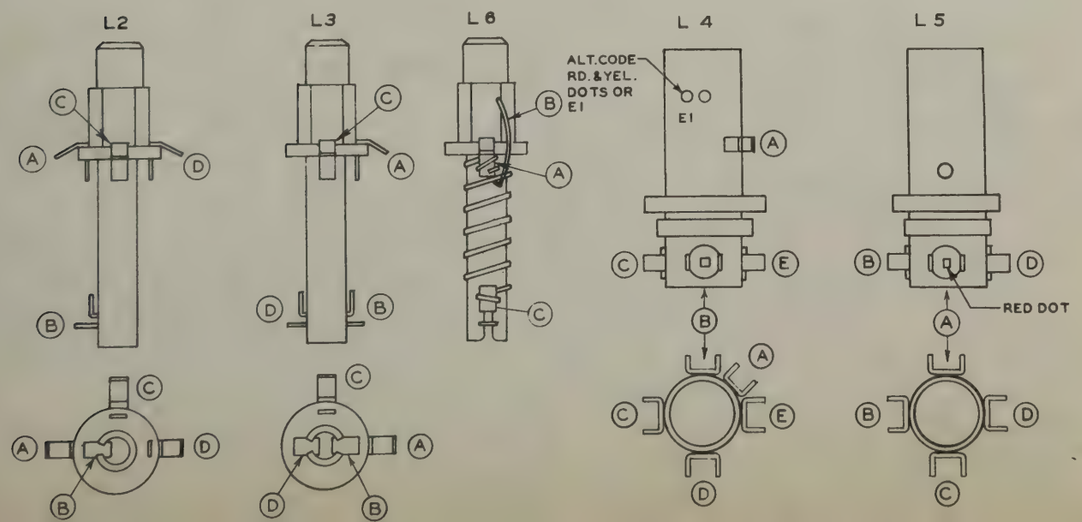
THE CARE OF PLASTIC CABINETS

It is imperative that these polystyrene cabinets not be left in a confined area where the temperature will rise above 150^{o}, as these conditions will damage the cabinets. The result will be warping and shrinkage.

They should not be exposed to exterminating gas of the chlorinated hydro-carbon variety inasmuch as this will completely destroy the velvet finish.

Fig. 6 7E01Z Schematic





ALL VOLTAGE MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER

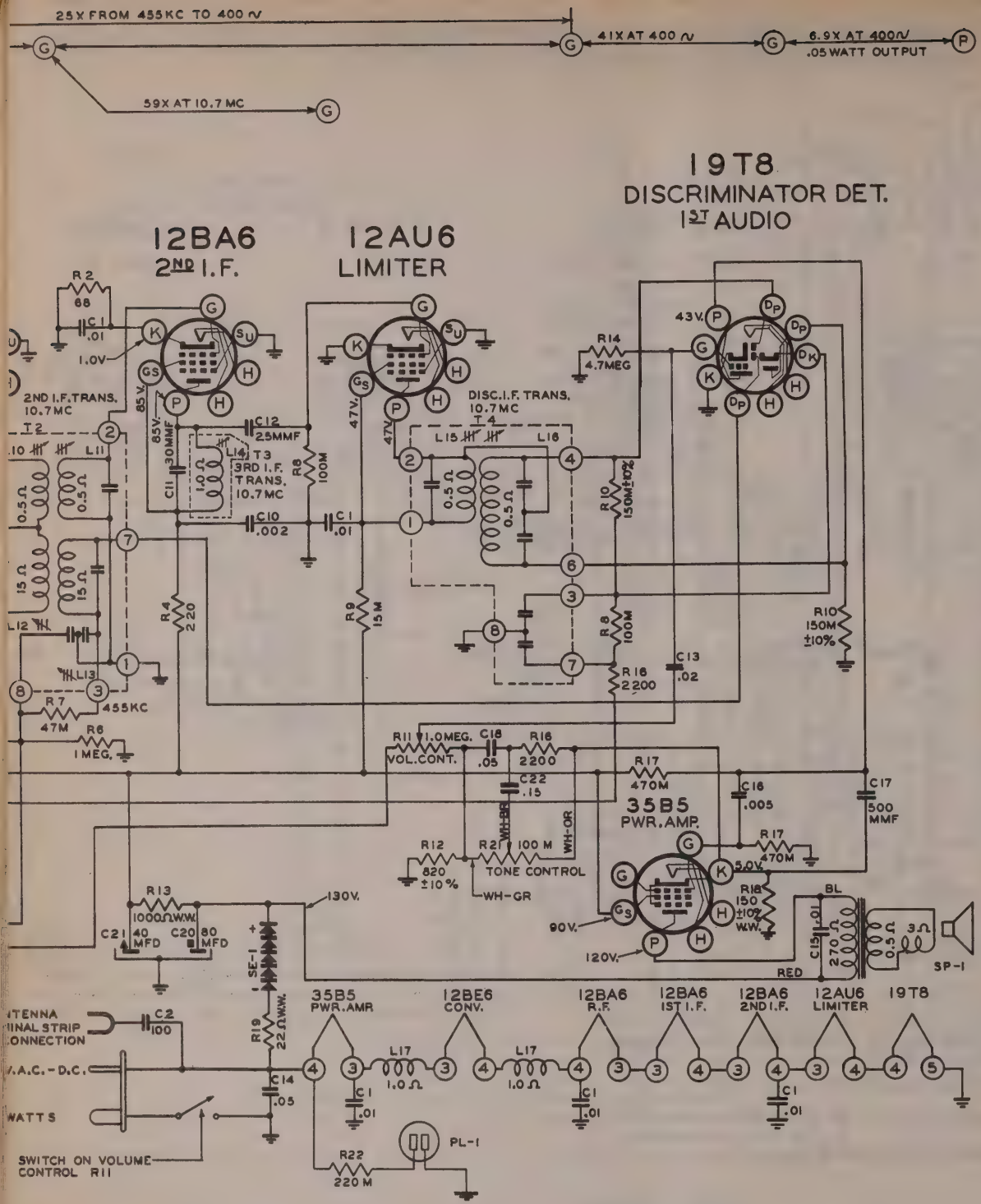
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED

ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED

AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7 M.C.

TUNING RANGES
540-1620 K.C. STD. B.C.
88-108 M.C. F.M. 100

DENOTES CHASSIS



ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED

ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED

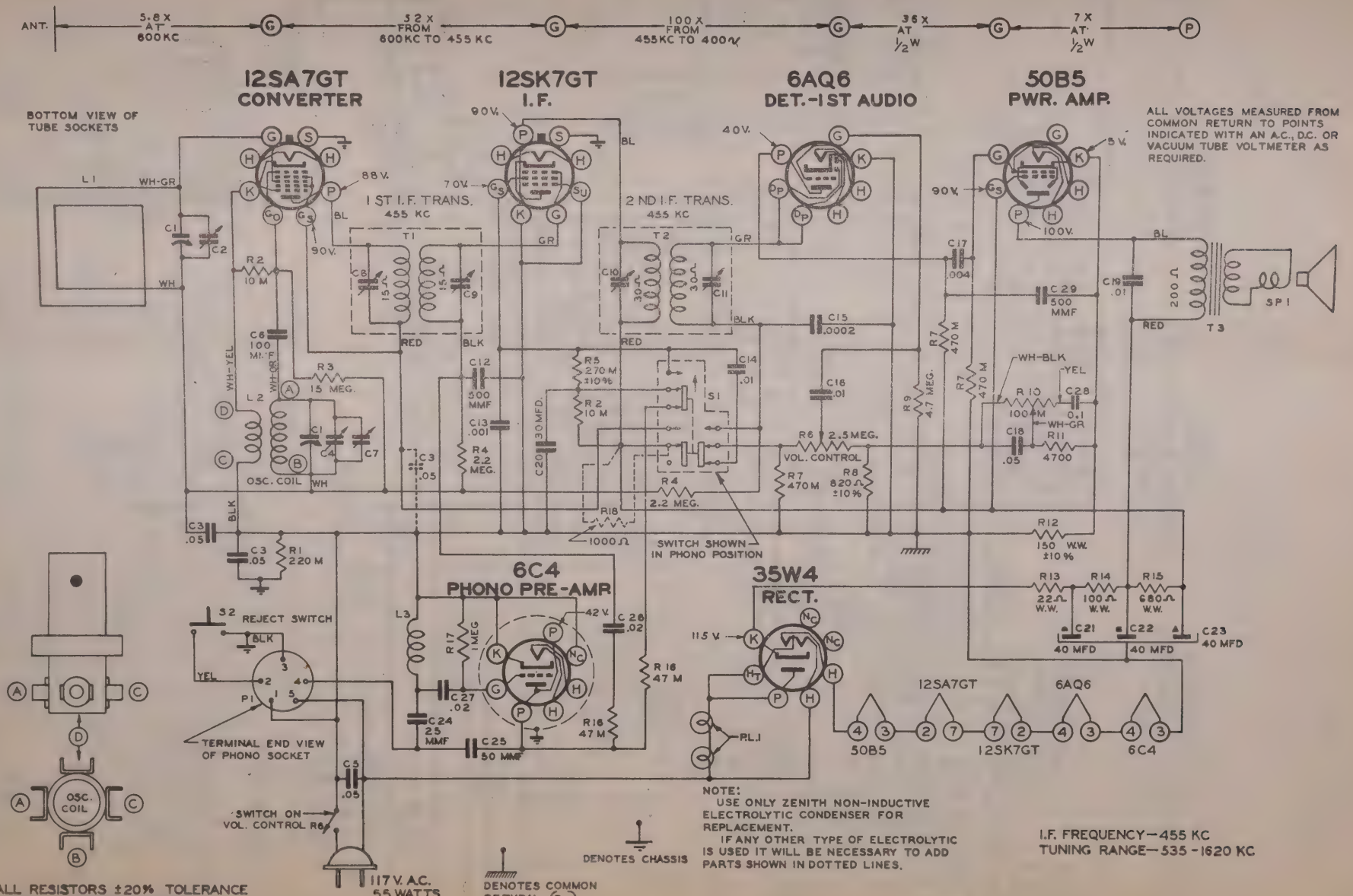
AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7 M.C.

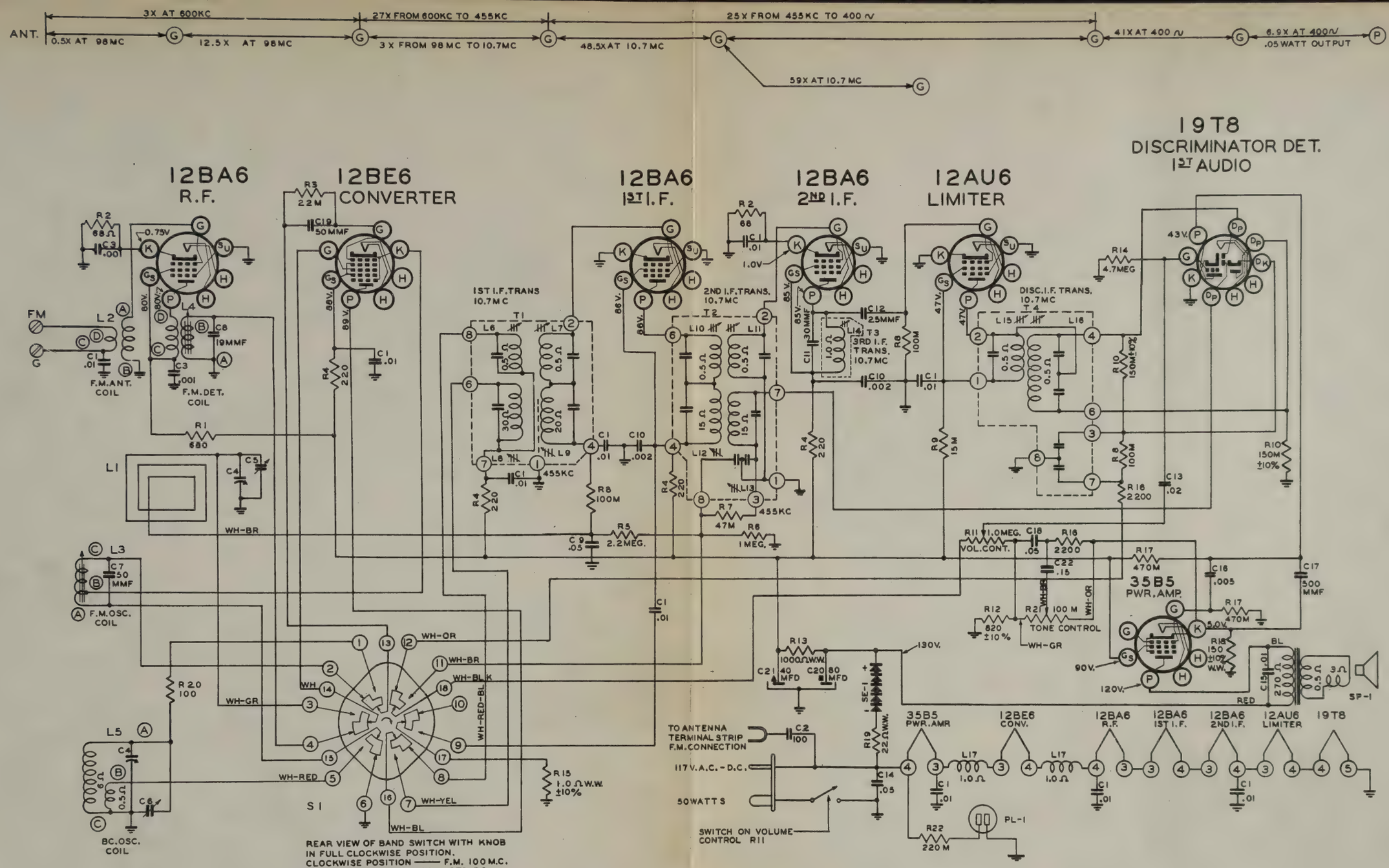
TUNING RANGES
540-1620 K.C. STD. BC.
88- 108 M.C. F.M. 100

DENOTES CHASSIS

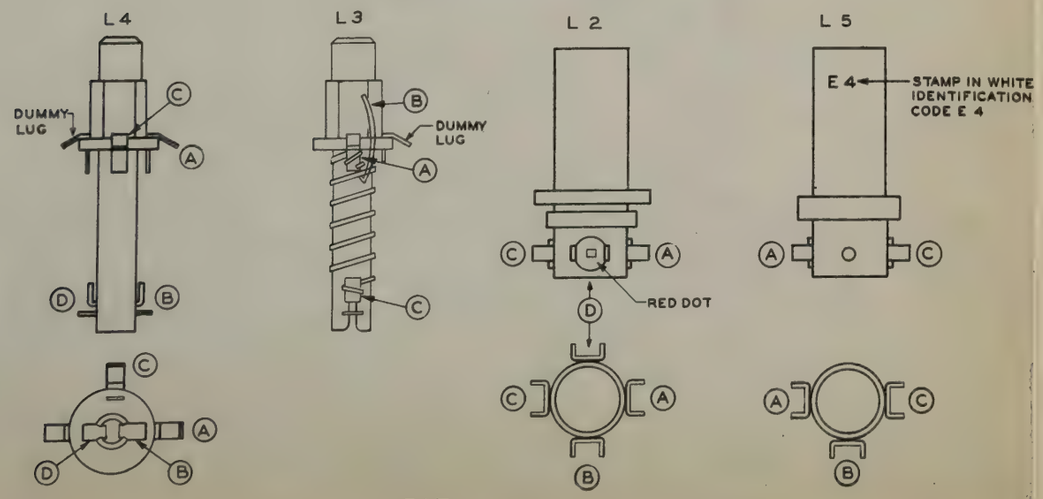
Fig. 8 9E21Z Schematic

Fig. 9 6E02Z Schematic


ANT.
5.8 X AT 600 KC
32 X FROM 600 KC TO 455 KC
100 X FROM 455 KC TO 400 V
36 X AT ½ W
7 X AT ½ W
12SA7GT CONVERTER
12SK7GT I.F.
6AQ6 DET.-1ST AUDIO
50B5 PWR. AMP.
BOTTOM VIEW OF TUBE SOCKETS
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER AS REQUIRED.
1 ST I.F. TRANS. 455 KC
2 ND I.F. TRANS. 455 KC
OSC. COIL
VOL. CONTROL
SWITCH SHOWN IN PHONO POSITION
6C4 PHONO PRE-AMP
35W4 RECT.
REJECT SWITCH
TERMINAL END VIEW OF PHONO SOCKET
SWITCH ON VOL. CONTROL R6
117 V. A.C. 55 WATTS
ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
DENOTES COMMON RETURN (B-)
NOTE: USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT. IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.
I.F. FREQUENCY—455 KC
TUNING RANGE—535 - 1620 KC
50B5
12SK7GT
6C4
12SA7GT
6AQ6



REAR VIEW OF BAND SWITCH WITH KNOB IN FULL CLOCKWISE POSITION.
CLOCKWISE POSITION —— F.M. 100 M.C.
COUNTER-CLOCKWISE POS.— STD. BC.



ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED

ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED

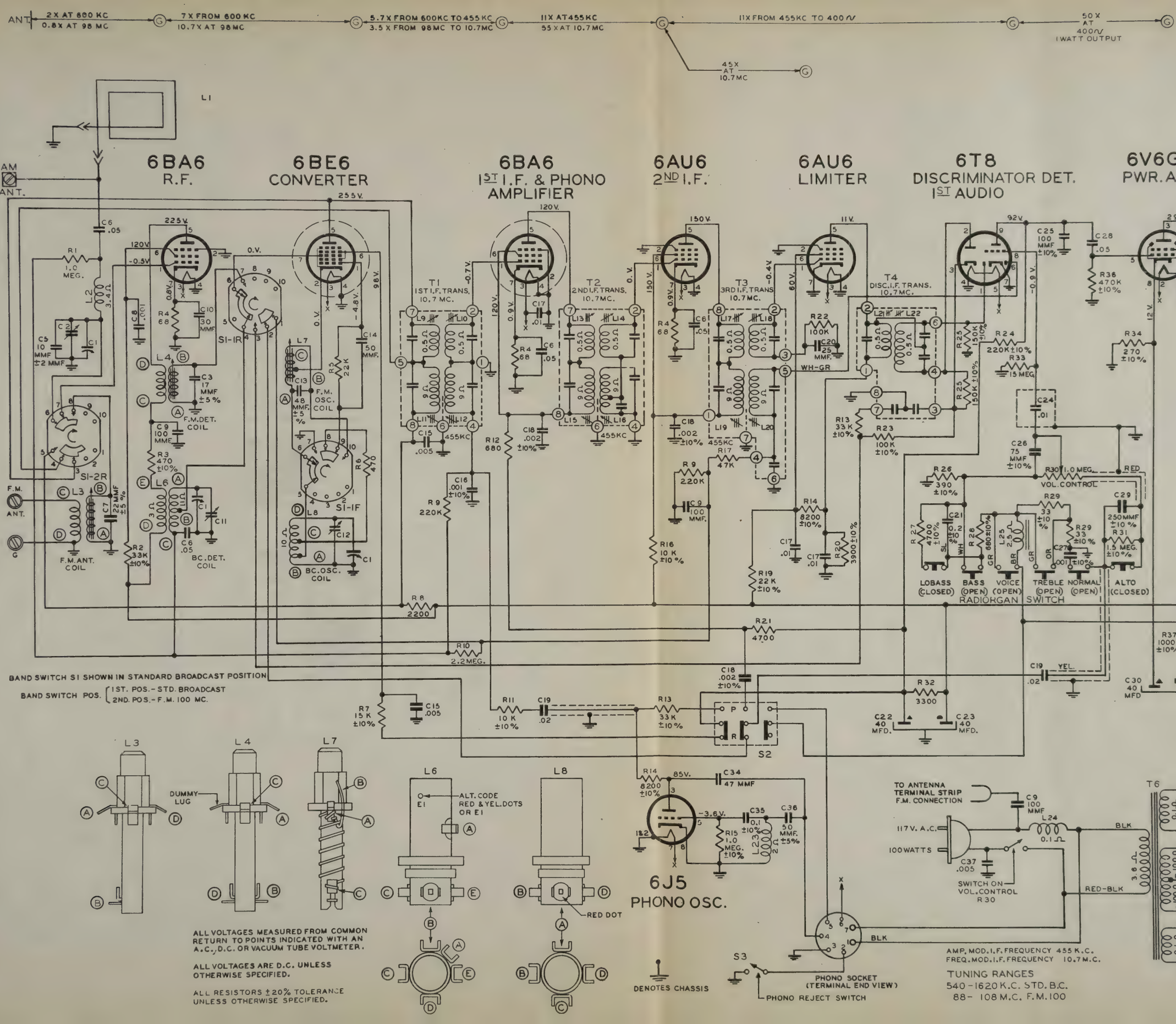
DENOTES CHASSIS

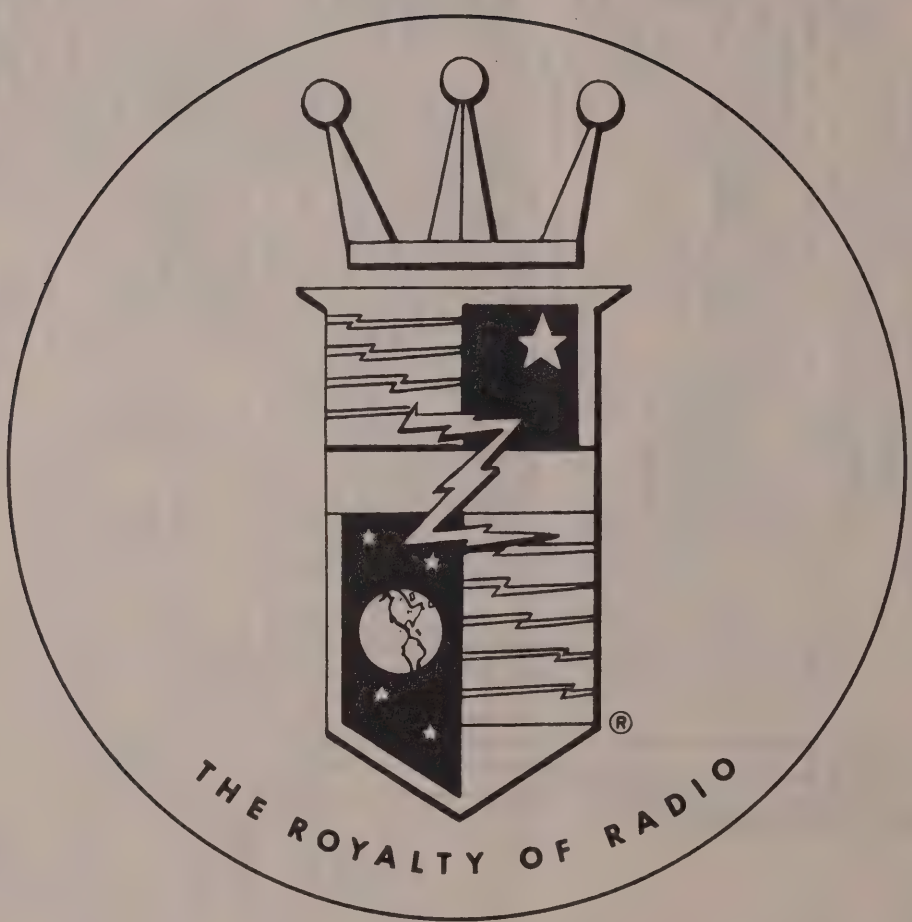
AMP.MOD.I.F.FREQUENCY 455 K.C.
FREQ.MOD.I.F.FREQUENCY 10.7M.C.

TUNING RANGES
540-1620 K.C. STD.BC.
88- 108 M.C. F.M. 100

Fig. 7 7E027 Schematic

Fig. 8 9E21Z Schematic




THE ROYALTY OF RADIO

ZENITH
REG. U.S. PAT. OFF.
LONG DISTANCE RADIO
REG. U.S. PAT. OFF.

HOUSEHOLD RECEIVER SERVICE BULLETIN NUMBER 6

PART NUMBER CHANGES ON S-14022,24,25 and 27 3-SPEED RECORD CHANGERS.

The part number of idler wheel 61-125 has been changed to G21771.

The part number of Wire Spring VM 2388 has been changed to VM 2338.

On later models Wire Spring VM 3252 heavy gauge is used, however, this cannot be substituted for Spring VM 2338 which is a light gauge spring.

DRIVE MECHANISMS ON S-14022, S-14024, S-14025 and S-14027

If any wearing or slipping off of speed drive belt 32-26 or difficulty with changer speed is encountered, replacement of the present speed bushings and drive belts with S-17224 Three Speed Phono Belt and Bushing Replacement Kit will eliminate these difficulties. This kit consists of two rubber drive belts and three newly designed speed bushings.

MODELS S-14033 & S-14034 THREE SPEED INTERMIXER RECORD CHANGERS

With the exception of motor assemblies, S-14033 is identical to S-14025 and S-14034 is identical to S-14027. For all service information refer to Record Changer Service Manual Z902.

The new Motor Assemblies and parts for S-14033 and S-14034 are listed below.

VM3129	Motor Assembly
VM3139	Turret Bushing (Drive Pulley) - 78 R.P.M.
VM3140	" " " " - 45 R.P.M.
VM3141	" " " " - 33 1/3 R.P.M.

CHANGES TO IMPROVE DIAL DRIVE MECHANISM

The dial drive assemblies used on the present table model AM-FM receivers can also be used on the earlier AM-FM table model receivers. The new assemblies consist of a new dial drive shaft with a pressed-on fiber bushing and a new dial cord.

With Models 7F01 - 7E01 - 7G01 use

1 S-16884 Tuning Shaft & Pulley Assembly
1 S-16887 Dial Cord & Eyelet Assembly

With Models 7E02 - 7E02Z - 7F02 - 7F04 - 7G02 & 7G04 use

1 S-16885 Tuning Shaft & Pulley Assembly
1 S-16888 Dial Cord & Eyelet Assembly

If you have experienced repeated dial cord trouble on older models, this should provide a permanent correction.

UNIVERSAL ANTENNA TRANSFORMER

In low signal areas where it is very difficult, if not impossible, to obtain all desired reception, Universal Antenna Transformer 95-1127 can be used as a substitute for the loop and can be connected to any Zenith receiver. This will materially increase the usable signals obtained. Complete instructions for connecting this transformer to a receiver are included with the transformer.

PHONO DISTORTION 8G20 - 8G22

Distortion is sometimes with us on certain type records. Possibly the first thought would be that the Cobra cartridge is defective but upon replacing this in some cases, the phono system squeals. To correct the condition of distortion and squeal, parallel C13 which is a 50 Mmf condenser with a 33 Mmf condenser - 22-2168. This completely eliminates this difficulty.

NOISY RECORD CHANGER 8G20 - 8G22

In some cases, jarring or moving the record changer or while the record changer is in operation, noise comes through the receiver as though the record changer mechanism were defective. The 12BA6 RF amplifier has plate and screen voltage on it and begins to oscillate around 100 megacycles. Any vibration will then modulate this oscillator and it will appear at the output of the receiver, as a noisy record changer. This condition can be eliminated by moving R1,220 ohm screen resistor that connects Pin #6 on the 12BA6 RF tube to Pin #11 on S1-2F bandswitch, to Pin #1 on S1-2F bandswitch. Thus, during phono operation the screen voltage is removed from the RF tube, and all possibility of oscillation is eliminated.

LOW IMPEDANCE WAVEMAGNET 8G20 - 8G21 - 8G22

To change to the low impedance loop on 8G20, 8G21 and 8G22, remove the high impedance loop and other parts. See Fig. 1 and List 1. Then add the low impedance loop and associated parts. See Fig. 2 and List 2.

List 1
Remove These Parts

L1	S16359	High Impedance Loop
C5	22-829	.05 Mfd. 200V
C6	22-1852	7.5 Mmf ceramic 500V
C7	22-3	.01 Mfd. ceramic 500V

List 2
Add These Parts

L1	S16841	Low Impedance Loop
L19	S14195	Loop Loading Coil
R12	631912	1.0 Meg. 1/2W
C5	22-829	.05 Mfd. 200V
C6	22-2140	15 Mmf ceramic 500V

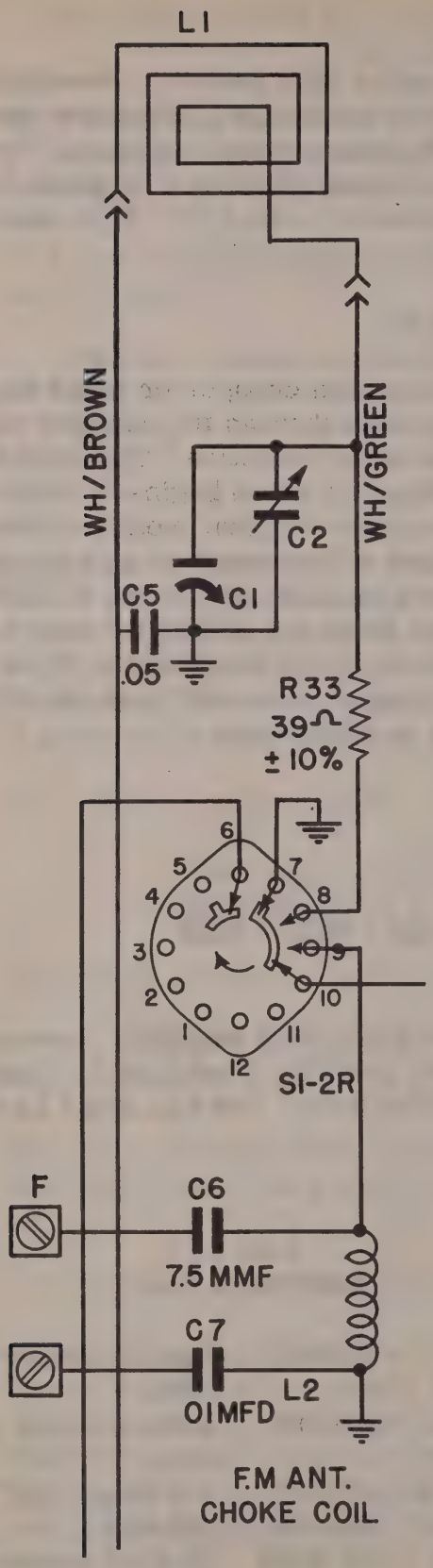


Fig. 1 Schematic for
High Impedance Loop

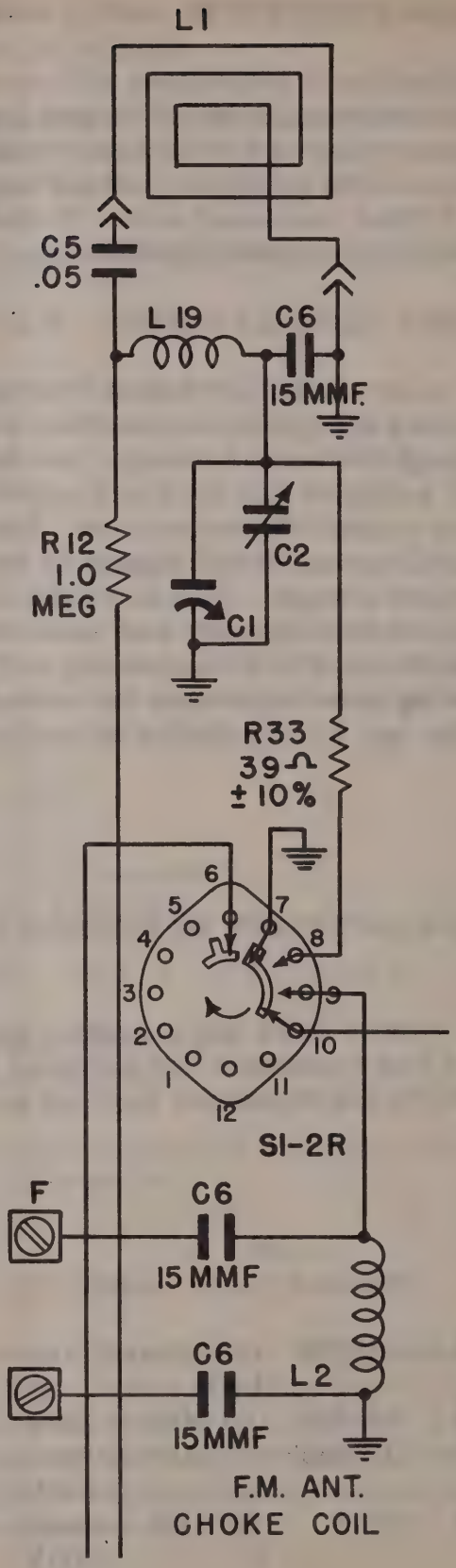


Fig. 2 Schematic for
Low Impedance Loop

Models
8ML985
and
8ML985E
Lincoln Part No.
8L-18805-A
and
8L-18805-B

Models
8ML985Z
and
8ML985ZE
Lincoln Part Nos.
8H-18805-A
and
8H-18805

SERVICE MANUAL

ZENITH
"LONG DISTANCE" AUTO RADIO

Made by ZENITH RADIO CORPORATION,

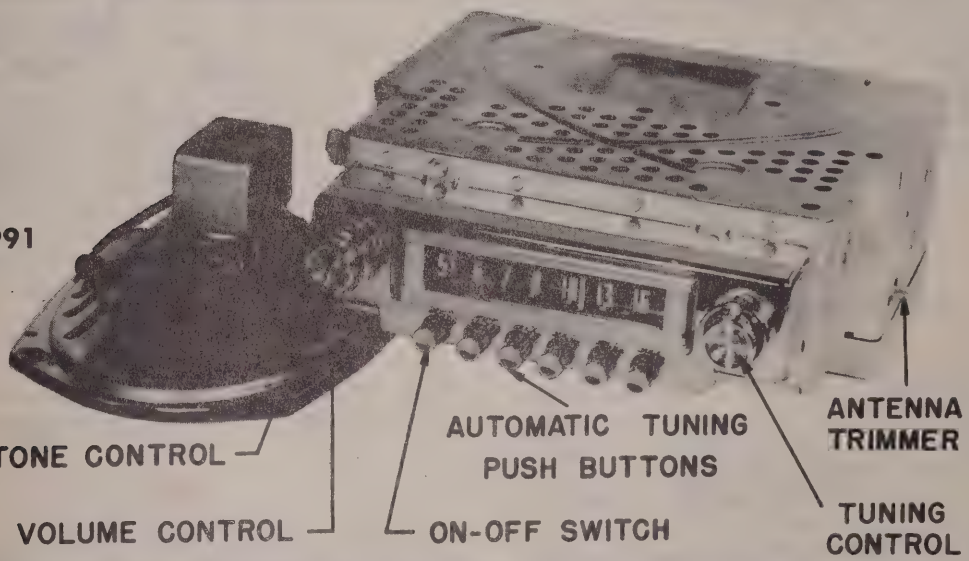
CHICAGO 39, ILLINOIS, U.S.A.

Models
8MF983
and
8MF983-E
Ford Part Nos.
8A-18805B-1
and
8A-18805

Models
8MM991
and
8MM991-E
Mercury Part Nos.
8M-18805-B
and
8M-18805

Fig. 1

Model 8MM991



These receivers are all identical electrically except export models, identified by the suffix "E" in the model number, which have a socket on the rear of the receiver case to accommodate an especially designed shortwave converter. For service information regarding the converter, see the converter Owners Manual.

Mechanically, there is a difference in the control knobs, the escutcheon and dial assemblies and the method of mounting the sets and speakers in the cars. The receivers carry the same Ford Motor Company part numbers and fit in the same cars as the previous models.

Electrical Specifications

SPEAKER:.....6" x 9" oval, instrument panel mounting.

CURRENT CONSUMPTION:.....8 amperes

TUBE COMPLEMENT: 6SK7GT R.F., 6SA7GT converter, 6SK7GT I.F., 6SQ7GT detector and 1st audio 6J5GT phase-inverter, 2-6V6GT push pull power output, and 6X5GT rectifier.

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....5 microvolts at one watt output

UNDISTORTED POWER OUTPUT:..... 6 watts measured at the voice coil.

Form FLM-49

Printed in U.S.A.—5M—CPC—8-49

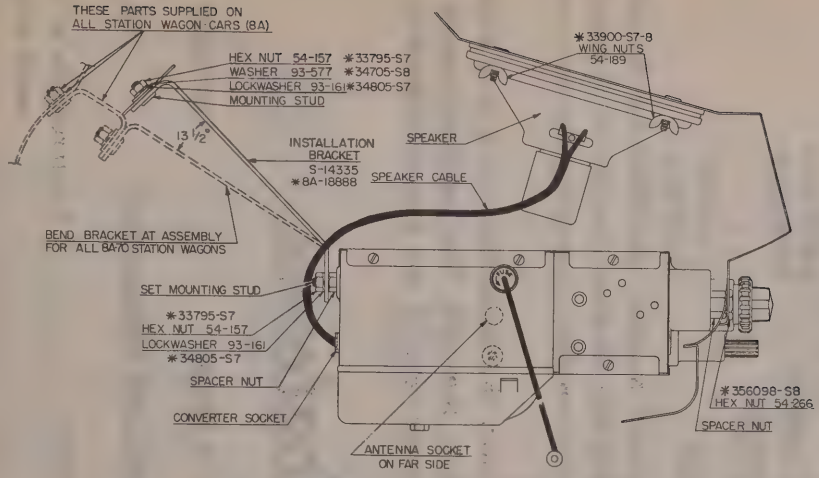


Fig. 2 Ford

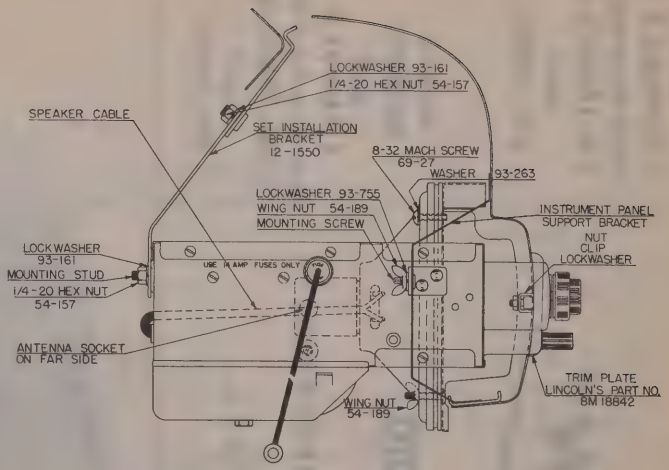


Fig. 3 Mercury

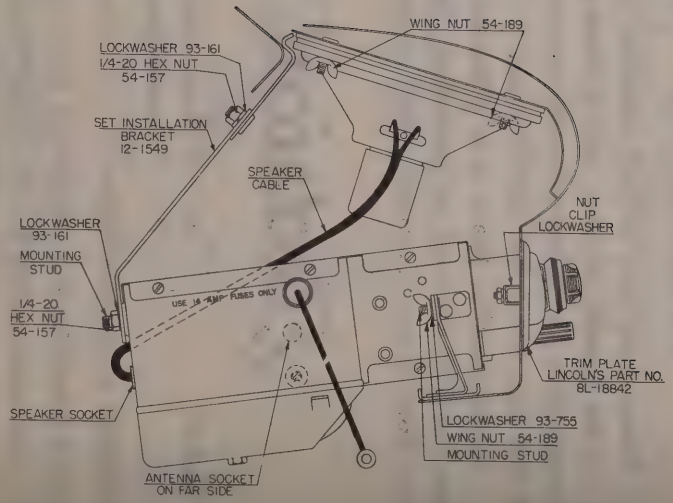


Fig. 4 8L-Lincoln

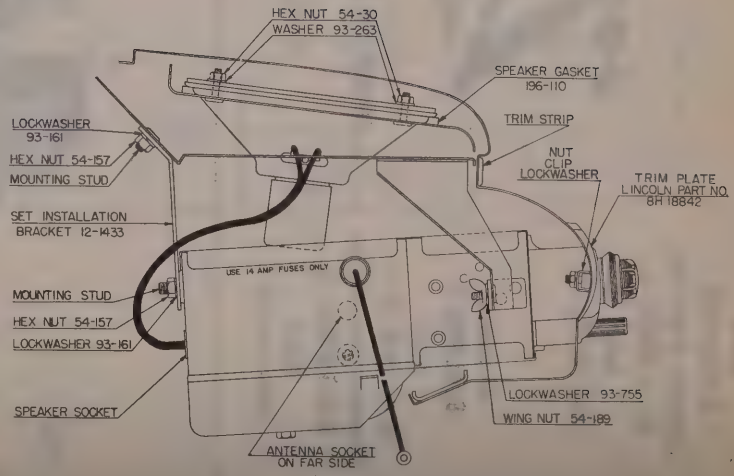


Fig. 5 8H-Lincoln

* Indicates Ford Part Number

RECEIVER INSTALLATION

Figures 2, 3, 4, and 5, illustrating the installed receivers, are given on the opposite page to facilitate removal and reinstallation of the receivers when service is necessary.

To take the receiver from Lincoln and Mercury cars:

1. Remove the plenum chamber of the heater (Model 8L Lincoln only), by removing the two sheet metal screws at each end of the chamber.

2. Disconnect the "A" lead at the set. Remove the speaker plug from the set and disconnect the antenna.

3. Loosen the top of the set installation bracket, and remove the bottom of the bracket from the set.

4. Remove the 8/32 wingnuts and lockwashers from the instrument panel support brackets. (Figs. 3, 4, 5)

To take the receiver from the Ford car:

1. Disconnect the "A" lead, the speaker cable, and the antenna from the receiver. (Fig. 2)

2. Remove the volume control, tone control, trim and tuning knobs from the set. Remove the two front hex-nuts 54-266. Disconnect the bottom of the set rear mounting bracket S-14335 by removing the hex-nut 54-157, and lockwasher 93-161 from the set rear mounting stud, and take the set from its position behind the instrument panel. (Fig. 2)

To take the speaker from the Mercury car:

Remove the stamped wingnut and the 8/32 machine screw holding the speaker to the rear of the instrument panel. (Fig. 3)

To take the speaker from the Model 8H Lincoln car: Pry off the trim strip along the bottom edge of the speaker grille. Remove the three sheet metal screws from the lower edge of the speaker grille, and remove the grille. Remove the two 8/32 hex nuts and flat washers holding the speaker in place. (Fig. 5)

To take the speaker from the Model 8L Lincoln car:
1. Remove the receiver from the car.
2. Remove the two stamped wingnuts from the stud bolts on the rear of the instrument panel. (Fig. 4)

To take the speaker from the Ford car:
1. Remove the receiver from the car.
2. Remove the four 8/32 wingnuts, No. 54-189 that hold the speaker on the rear of the instrument panel. (Fig. 2)

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push-buttons. (Fig. 1) Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push-button. (Fig. 1.)

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Fig. 1) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Fig. 1)

TONE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

AUTOMATIC TUNING

Automatic push-button tuning is provided by means of 5 push-buttons located directly under the dial scale and to the right of the "Off" push-button (Fig. 1). These five buttons permits the selection of five favorite local stations. When the push-buttons have been set to the desired stations it is only necessary to press a push-button to receive the station for which the adjustment was made. The dial pointer will automatically indicate the frequency of the selected station.

SETTING THE PUSH-BUTTON TUNER

The five push-buttons may be adjusted to any of the desired stations. In order to simplify the identification of these stations, it is advisable to set the push-buttons in sequence according to their frequencies, beginning with the station broadcasting on the lowest frequency and progressing to the station broadcasting on the highest frequency. The push-buttons should be set up during the daytime because at night, distant stations will be heard with the same volume as local stations, making it difficult to select local stations.

To set the push-buttons, proceed as follows:

1. Collapse the antenna.

2. Allow the receiver to operate for at least fifteen minutes before adjusting the push-buttons. This will allow each part in the receiver to reach normal operating temperature.

3. Loosen the first push-button on the left by turning it counterclockwise one turn.

4. Select the station desired and, with low volume, tune it in by turning the manual tuning knob. Tune very carefully for clearest reception.

5. Press the first push-button in firmly, then release and tighten as much as possible (with your fingers) by turning clockwise. The first push-button is now set for this station selection. Follow the above procedure for setting each of the other four buttons. After the push-buttons have been set extend the antenna to the lowest position necessary for good reception.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 6(Ford #80-145)

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 7)

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1 1/2 inches from the distributor cap. (Fig. 8)

The ignition coil condenser, No. 22-1767, should be connected to the BAT. terminal of the ignition coil. (Fig. 9)

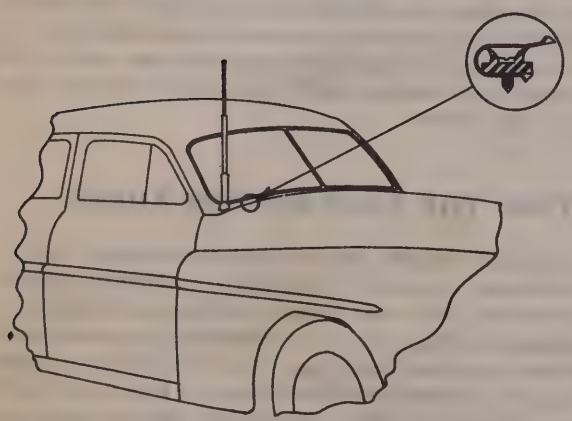


Fig. 6

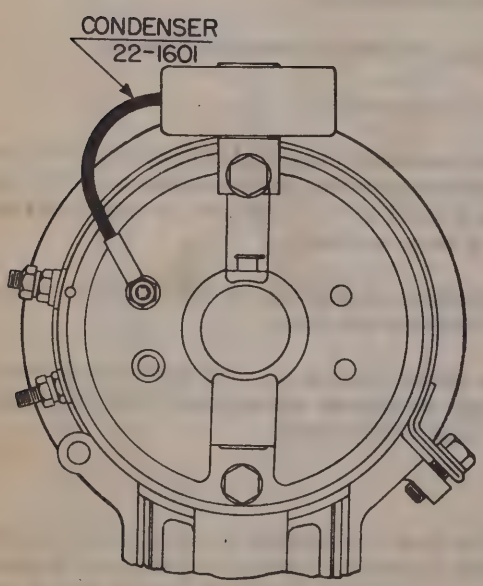


Fig. 7

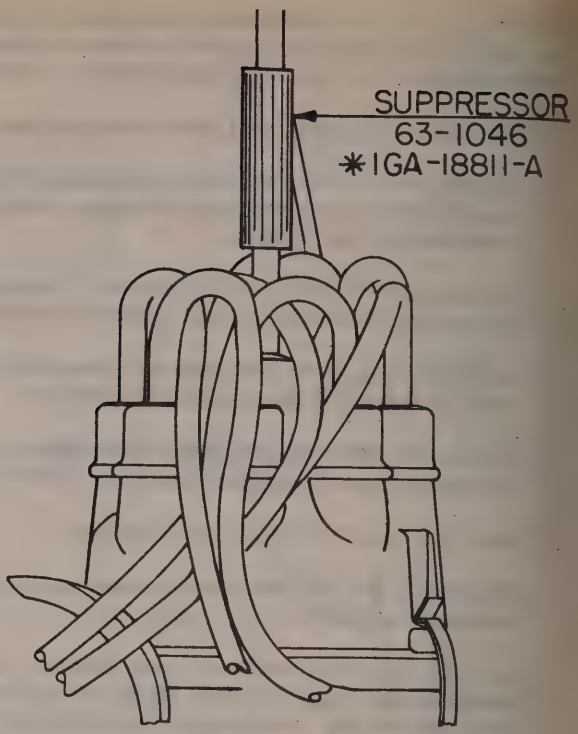


Fig. 8

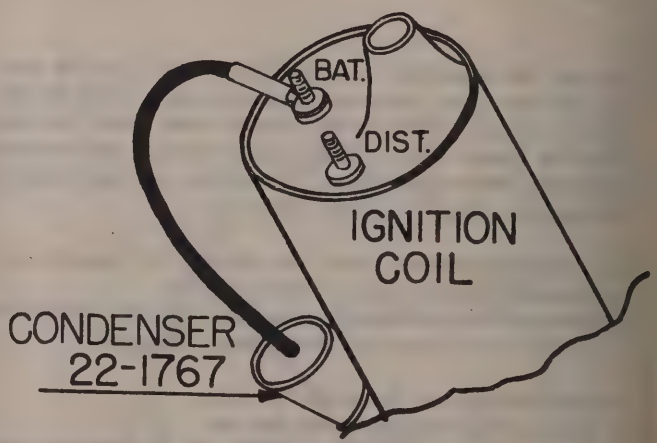
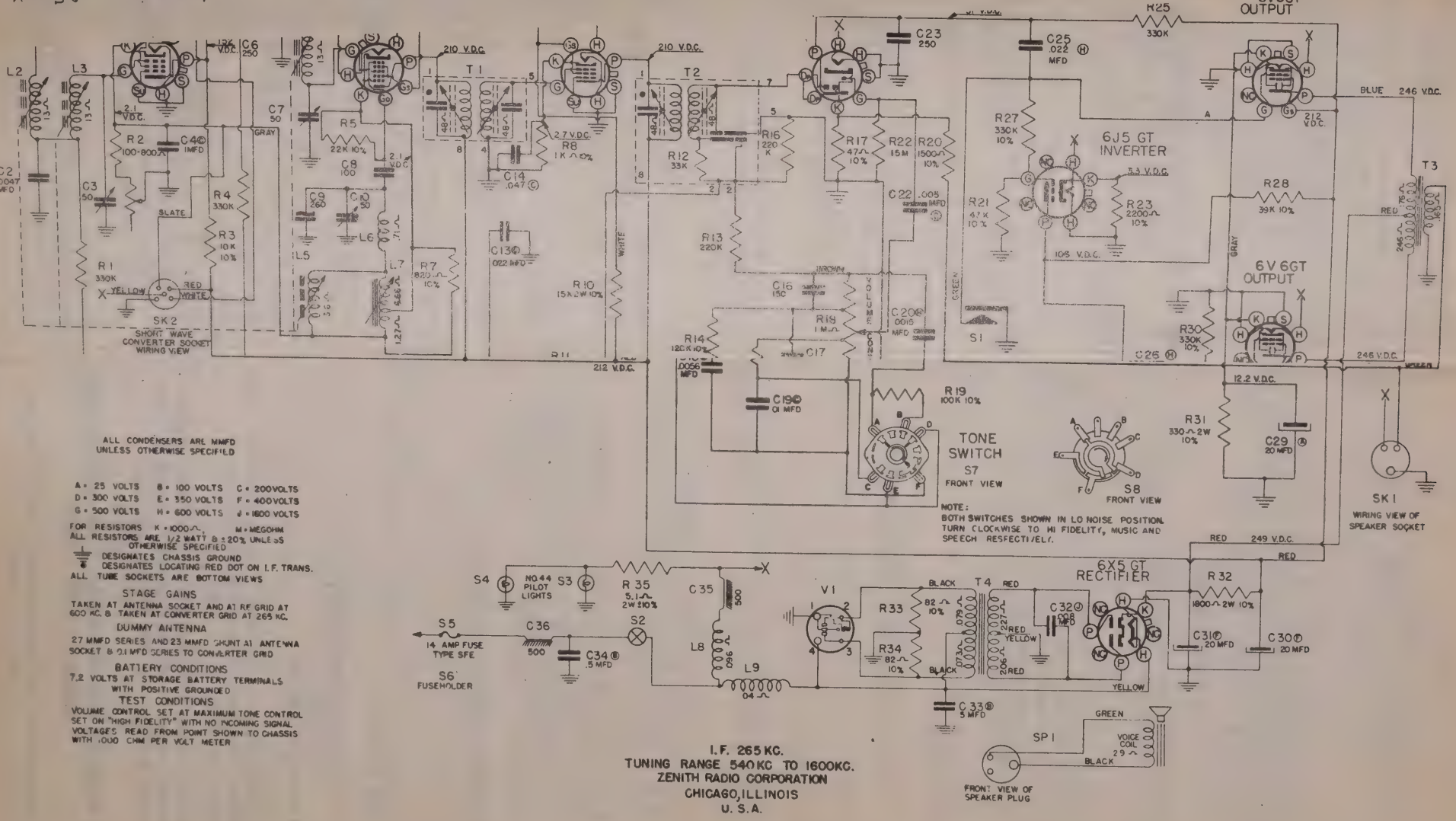


Fig. 9


6J5 GT INVERTER
6V6GT OUTPUT
6X5 GT RECTIFIER
TONE SWITCH
S7
FRONT VIEW
S8
FRONT VIEW
SK2
SHORT WAVE CONVERTER SOCKET WIRING VIEW
SK1
WIRING VIEW OF SPEAKER SOCKET
SP1
FRONT VIEW OF SPEAKER PLUG
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED
A = 25 VOLTS B = 100 VOLTS C = 200 VOLTS
D = 300 VOLTS E = 350 VOLTS F = 400 VOLTS
G = 500 VOLTS H = 600 VOLTS J = 1600 VOLTS
FOR RESISTORS K = 1000Ω, M = MEGOHM
ALL RESISTORS ARE 1/2 WATT @ ±20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
DESIGNATES LOCATING RED DOT ON I.F. TRANS.
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT RF GRID AT 600 KC. & TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
27 MMFD SERIES AND 23 MMFD SHUNT AT ANTENNA SOCKET & .01 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
7.2 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH FIDELITY" WITH NO INCOMING SIGNAL. VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
NOTE:
BOTH SWITCHES SHOWN IN LO NOISE POSITION. TURN CLOCKWISE TO HI FIDELITY, MUSIC AND SPEECH RESPECTIVELY.
I.F. 265 KC.
TUNING RANGE 540 KC TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS
U. S. A.

SCHEMATIC

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 6(Ford #80-145)

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 7)

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1 1/2 inches from the distributor cap. (Fig. 8)

The ignition coil condenser, No. 22-1767, should be connected to the BAT. terminal of the ignition coil. (Fig. 9)

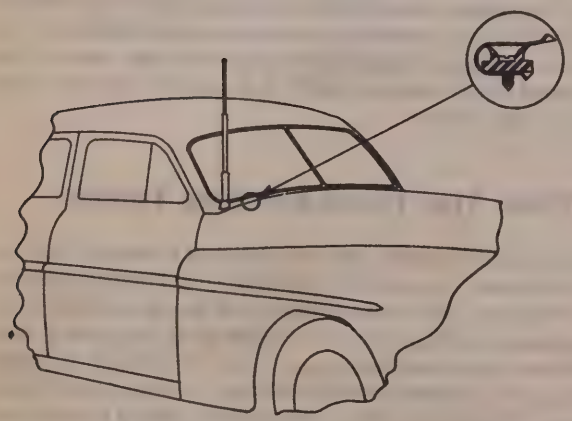


Fig. 6

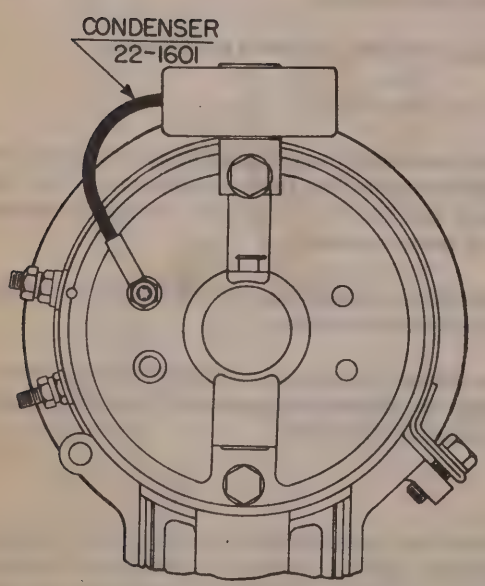


Fig. 7

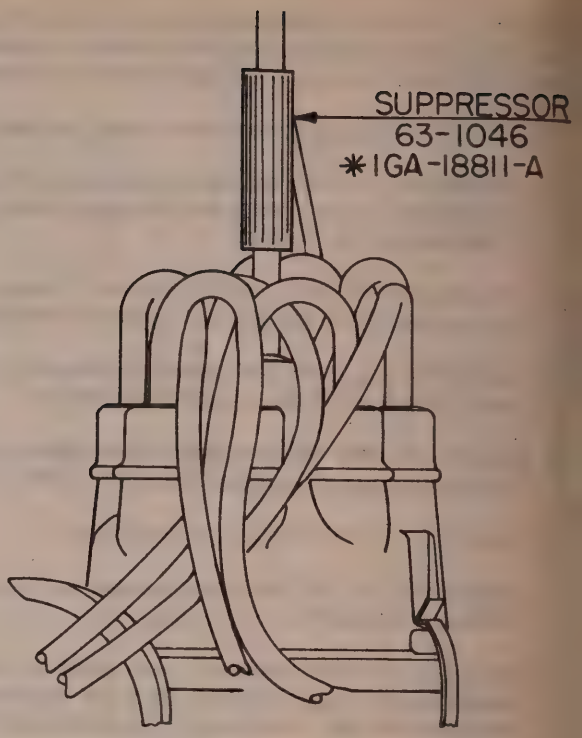


Fig. 8

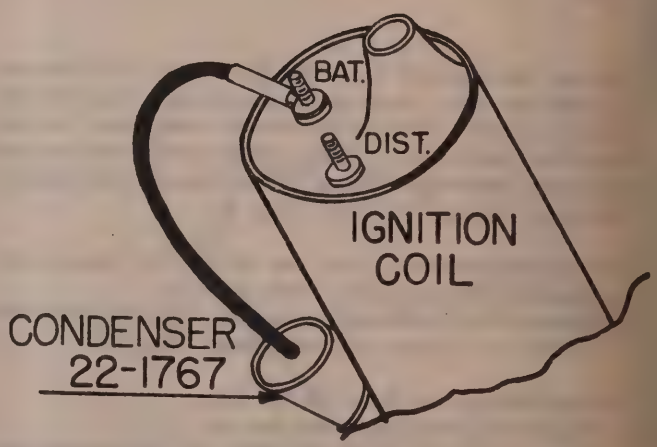


Fig. 9

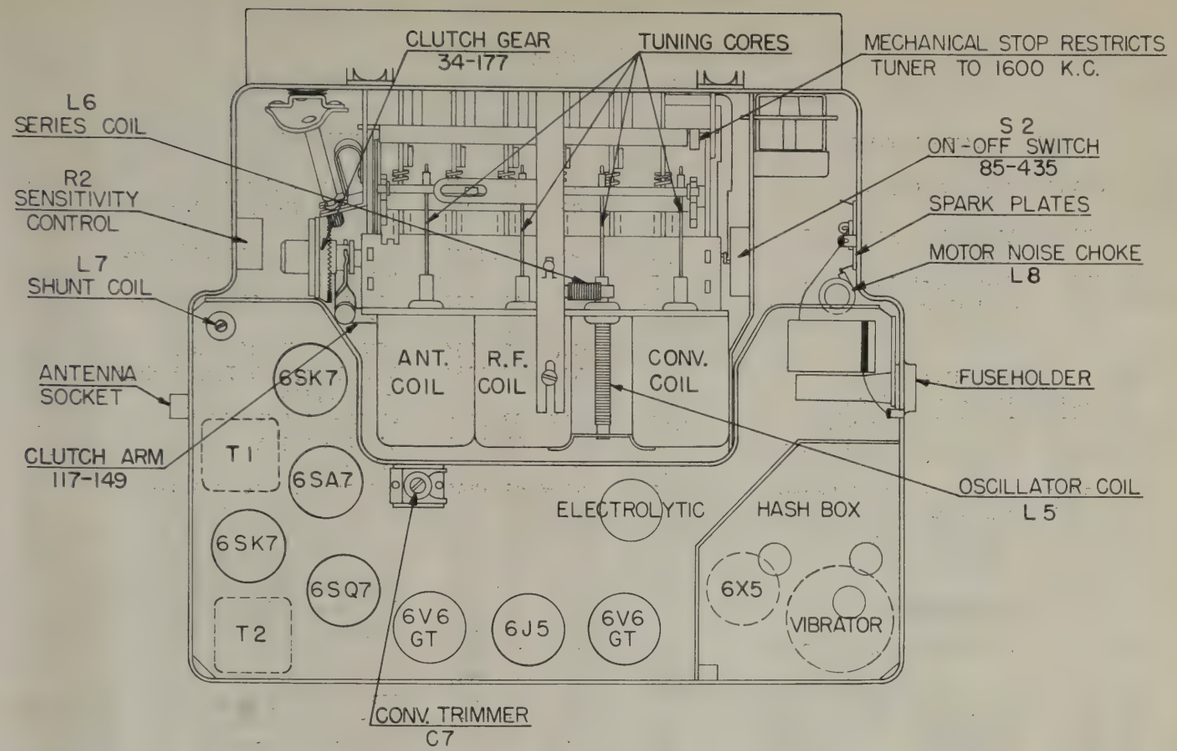


Fig. 10 Top View of Chassis

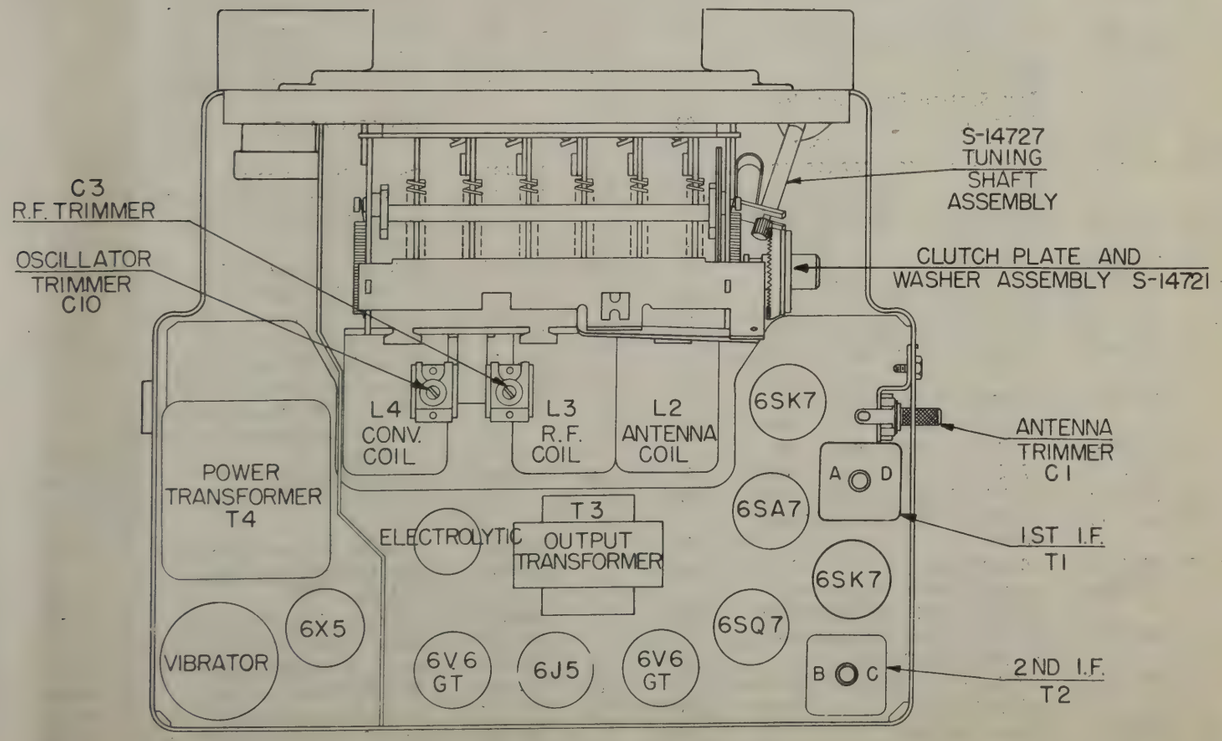


Fig. 11 Bottom View of Chassis

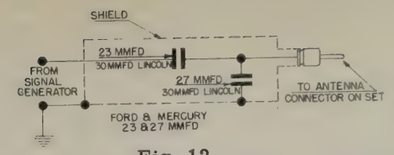


Fig. 12

Figure 12 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

The sensitivity control R2 is factory pre-set and should not be readjusted.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 6SA7GT converter grid. (Pin No. 8 on socket)
4. Adjust concentric primary and secondary I.F. cores A, B, C, and D in order named with alignment wrench 68-7. Repeat operation to assure accurate alignment. (Figs. 10 and 11)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 12, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 11) for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-7, R.F., trimmer C3 and antenna trimmer for maximum response, (Figs. 10 and 11)
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 10)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. With pliers remove the bushing tension clip from the cross arm insulating bushing.
3. With core alignment tool, part No. S-13064, screw the core in, or out, to the desired position.
4. After all adjustments or replacements are completed, be sure to replace the bushing tension clip.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 12, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (Fig. 11) at 1675 Kc.
6. Adjust the converter trimmer C-7, R.F. trimmer C3, and antenna trimmer C-1 (Figs. 10 and 11) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about 11/16 of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (Fig. 10) to scale at 1300 Kc.
10. Adjust the antenna core L-2, R.F. core L3, and converter core L-4 (Fig. 11) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-7 (Fig. 10) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.

PARTS LIST

Diag. No.	Part No.	Description	Price
		COILS AND CHOKES	
L2-3 L4-5	S-14295	Tuner Coil Unit Assem.	6.25
L8	S-14761	Motor Noise Choke Coil Assem.	.35
L7	S-14846	Osc. Shunt Coil Assem.	.85
	19-181	Coil Mounting Clip (Used on S-14846)	.06
L9	20-213	Main Hash Choke	.36
T1	95-1134	1st IF Transformer	1.60
T2	95-1135	2nd IF Transformer	1.85
L1	S-8819	Ant. Motor Noise Choke Assem.	.40
L6	S-14226	Osc. Series Coil Assem.	.35
L2-3	S-14227	Ant. & RF Coil Assem.	.90
L5	S-14228	Osc. Coil Assem.	.75
		CONDENSERS	
C5-11 C14	22-162	100 MMFD Mica 500V	.20
C23	22-182	220 MMFD Mica 500V	.26
C6	22-1136	250 MMFD Mica 500V	.20
C16	22-1137	150 MMFD 500V	.20
C34 C29	22-1238	.5 MFD 120V	.50
C30 C31	22-1484	Electrolytic 20 MFD 25V-20-20 400V MFD	2.10
C9	22-1712	260 MMFD Compensator	.50
C7	22-1715	Single Section Trimmer (Converter)	.35
C3-10	22-1722	Two Section Trimmer (RF & Osc.)	.60
C33	22-1728	.5 MFD. 100V	.55
C24	22-1748	.1 MFD (or 22-1906-22-170) 400V	.26
C25 C26	22-1750	.022 MFD (or 22-1908-22-992-22-1709) 600V	.26
C13	22-1751	.022 MFD 200V	.20
C2	22-1752	.0047 MFD (or 22-1022 22-1910) 600V	.26
C32	22-1771	.008 MFD (or 22-1448)1600V	1.00
C4	22-1777	.1 MFD (or 22-190-22-1916) 200V	.26
C2	22-1783	.0047 MFD (or 22-906 22-1922) 400V	.20
C19	22-1784	.01 MFD (or 22-1466 - 22-1923-22-2014) 400V	.20
C22	22-1778	.047 MFD (or 22-1917) 200V	.26
C20	22-1785	.0015 (or 22-1743 22-1924) 400V	.20
C17	22-1949	560 MMFD Mica 300V	.30
C1	22-1960	Single Section Trimmer Antenna (8ML985-8ML985Z)	.55
C1	22-1961	Single Section Trimmer(Ant.) (8MF983-8MM991)	.55
C18	22-2046	.56 MFD (or 22-2047-22-2048 22-2049) 200V	.30
C27	93-686	Fibre Washer	.02
C27	64-4	Rivet	.01
C27	93-297	Metal Washers	.01
C27	27-87	Mica	.03
C27	57-1054	Plate	.10

Diag. No.	Part No.	Description	Price
		RESISTORS	
R2	63-1267	Sensitivity Control	.56
R35	63-1375	5.1 Ohm W.W. 2W 10% Ins. (8MF983)	.33
R32	63-1620	1800 Ohm (or 63-1691) 2W 10% Ins.	.36
R31	63-1622	330 Ohm (or 63-1692) 2W 10% Ins.	.36
R10	63-1624	15K Ohm 2W 10% Ins.	.36
R18	63-1654	Vol. Control & Tone Switch (or 63-1590)	2.50
R17	63-1729	47 Ohm 1/2 W 10% Ins.	.21
R-33 R-34	63-1740	82 Ohm 1/2 W. 10% Ins.	.21
R7	63-1782	820 Ohm 1/2 W. 10% Ins.	.21
R23	63-1785	1K Ohm 1/2 W 10% Ins.	.21
R17	63-1792	1500 Ohm 1/2 W 10% Ins.	.21
R23	63-1799	2200 Ohm 1/2W 10% Ins.	.21
R3	63-1827	10K Ohm 1/2 W 10% Ins.	.21
R5	63-1841	22K Ohm 1/2 W 10% Ins.	.21
R28	63-1852	39K Ohm 1/2W 10% Ins.	.21
R21	63-1855	47K Ohm 1/2 W 10% Ins.	.21
R5	63-1862	68K Ohm 1/2 W 10% Ins.	.21
R17	63-1862	68K Ohm 1/2 W 10% Ins.	.21
R19	63-1869	100K Ohm 1/2W 10% Ins.	.21
R14	63-1873	120K Ohm 1/2W 10% Ins.	.21
R13 R16 R27	63-1884	220K Ohm 1/2W 10% Ins.	.21
R30	63-1890	330K Ohm 1/2W 10% Ins.	.21
Rl-4	63-1891	330K Ohm 1/2W 20% Ins.	.21
R9-11	63-1912	1 Megohm 1/2W 20% Ins.	.21
R22	63-1961	15 Megohm 1/2W 20% Ins.	.21
		MISCELLANEOUS	
	24-449	Power Pack Cover	
SP1	49-627	P.M.Speaker & Cable (6" x 9" Oval) (8MF983-8ML985-8MM991)	7.75
SP1	49-656	P.M. Speaker & Cable (6" x 9" Oval) (8ML985Z)	7.75
	52-451	Battery Cable - Fuse to Set	.35
	52-470	Speaker Cable & Plug	.45
	54-256	Speed Nut (Holds 52-451)	.02
	54-259	Speed Nut (2 used) (8MF983)	.10
	73-50	6-32 x 1/4" Headless Slotted Set Screw Cuppoint (used with S-15498)	.02
SK1	78-728	Speaker Socket	.20
	78-796	Antenna Connector Socket	.20
	78-801	Octal Base Tube Socket (4 used)	.15
	78-804	Vibrator Socket	.20
	78-836	Octal Tube Socket (2 used)	.15
	78-837	Octal Tube Socket (2 used)	.15
T3	95-1079	Output Transformer	4.00
T4	95-1143	Power Transformer	7.25
	149-63	Iron Core & Spring (4 used)	.40
V1	190-22	Vibrator	4.15
	196-91	Speaker Gasket (8MF983-8MM991-8ML985)	1.25
	196-110	Speaker Gasket (8ML985Z)	.08

Diag. No.	Part No.	Description	Price
	202-608	Interference Elimination Instruction Sheet (8MM991)	.08
	202-605	Interference Elimination Instruction Sheet (8MF983)	.08
	202-607	Interference Elimination Instruction Sheet (8ML985)	.08
	202-615	Interference Elimination Instruction Sheet (8ML985Z)	.08
	202-703	Instruction Book (Owner's Manual) (8MF983)	.12
	202-709	Instruction Book (Owners Manual) (8MM991)	.12
	202-705	Instruction Book (Owners Manual) (8ML985)	.12
	202-707	Instruction Book (Owners Manual) (8ML985Z)	.12
	12-1433	Set Installation Bracket (8ML985Z)	.10
	12-1549	Set Installation Bracket (8ML985)	.10
	S-14335	Installation Brkt. Assem (8MF983)	.25
	S-15340	Case Cover and Spring Assem. Wiring Section	
	S-15577	Case Cover and Spring Assem. Tube Section	
	S-15640	Receiver Case and Spark Plate Assembly (8MM991)	
	S-15641	Receiver case and spark plate Assembly (8MF983)	
	S-15644	Receiver Case & Spark Plate Assembly (8ML985)	
	S-15646	Receiver Case & Spark Plate Assembly (8ML985Z)	

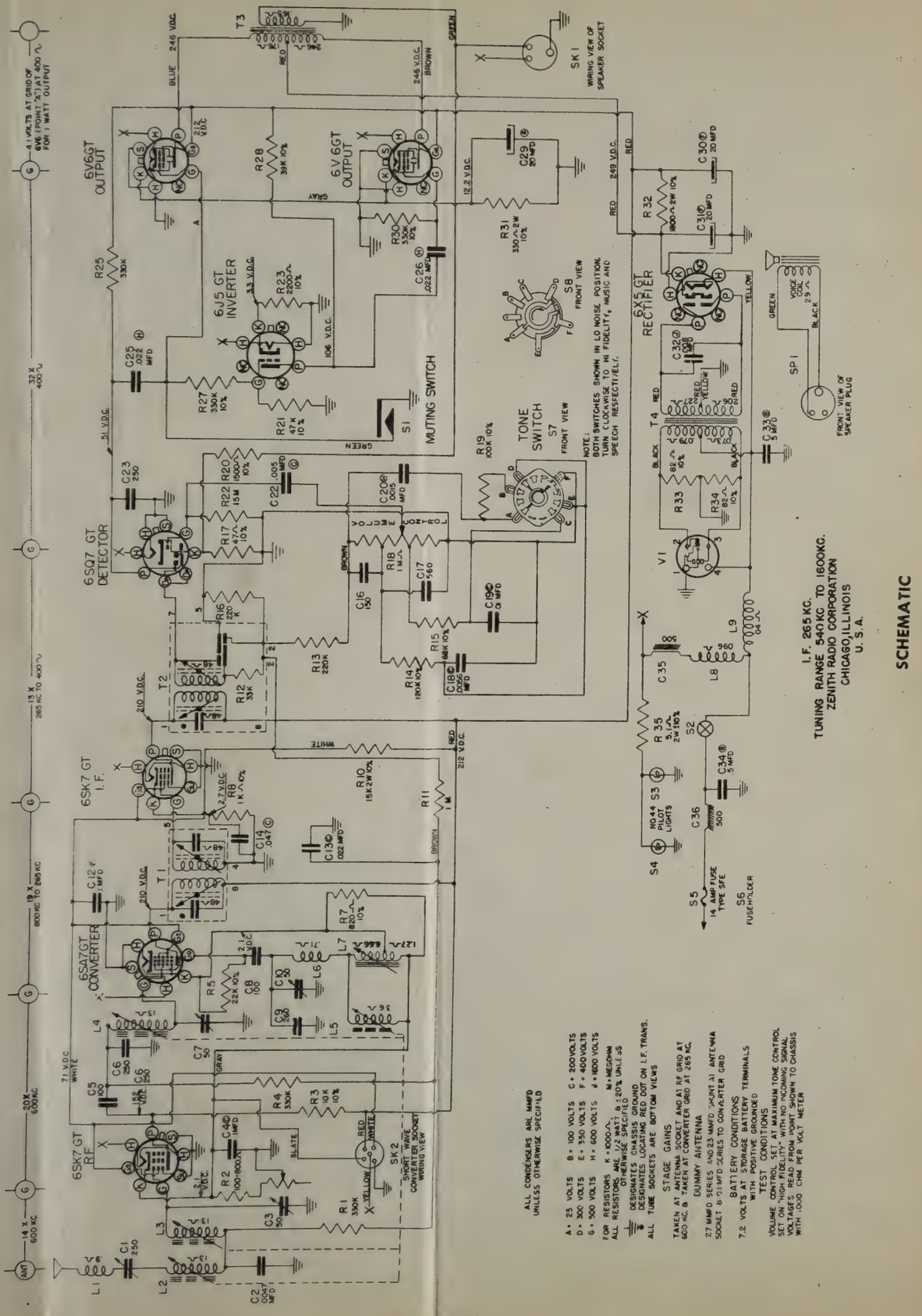
TUNER UNIT

	S-14721	Clutch Plate & Washer Assy.	.65
	S-14727	Tuning Shaft, Pinion Gear & Coupling Assy.	.50
	S-14733	Muting Switch Assy.	.05
	17-102	Cam Lock	.03
	34-177	Clutch Gear	.70
	52-228	Cross Arm Guide Rod	.15
	64-162	.088 Dia. X 5/32" Rivet	.01
	73-118	6-32 X1/4" Hex.Hd.Slotted Set Screw (2 used)	.02
	80-640	Yoke Tension Spring (2 used)	.08
	80-641	Clutch Release Bar Spring	.01
	80-642	Clutch Spring	.02
S2	85-435	On-Off Switch	.50
	93-921	Tuning Shaft Steel Washer	.02
	93-922	Tuning Shaft Spring Washer	.02
	93-923	Fishpaper Washer (2 used)	.01
	97-305	Clutch Arm Stud	.03
	117-149	Clutch Lever	.15
	188-111	Retaining Ring (2 used)	.02
	S-14739	"Off" Button Assembly	.50
	S-15331	Push Button Assembly	.50

Diag. No.	Part No.	Description	Price

DIAL ASSEMBLY

	12-1435	Scale Retaining Bracket (8MM991-8ML985-8ML985Z)	.01
	12-1437	Dial Scale Mtg. Brkt (8MF983)	.08
	19-165	Insulating Bushing Tension Clip (Cross Arm)	.03
	19-167	Window Retaining Clip (R.H.) (8MF983)	.03
	19-168	Window Retaining Clip (L.H.) (8MF983)	.03
	26-392	Dial Scale (8ML985-8ML985Z)	3.00
	26-409	Dial Scale (8MF983)	.90
	26-412	Dial Scale (8MM991)	3.00
	46-701	Tone Control Knob	.45
	46-711	Tone Control Knob	.55
	57-1338	Escutcheon (8ML985-8ML985Z)	2.00
	57-1339	Escutcheon (8MM991)	2.50
	S-14658	Escutcheon Assembly (8MF983)	.50
	57-1344	Dial Background Plate (8MM991)	.12
	57-1356	Dial Background Plate (8ML985-8ML985Z)	.60
	80-232	Knob Retaining Spring	.02
	80-586	Cross Arm Tension Spring (2 used)	.07
	80-625	Pointer Link Tension Spring	.08
	80-651	Pointer Retaining Spring	.03
	83-1523	Dial Scale Filter Strip (8MF983)	.15
	83-1564	Felt Strip (8MM991)	.15
	83-1576	Felt Strip (8ML985-8ML985Z)	.15
	83-1583	Felt Strip (Used on Esc.) (8MF983)	.10
	94-607	Tuning Shaft Bushing (8MF983)	.20
	94-609	Cross Arm Insulating Bushing	.05
	94-608	Vol. Control Bushing (8MF983)	.20
	100-36	Dial Light Bulb (2 used)	.09
	112-699	4-40 X 3/16" R.H.S.T. Screw Steel Cad (4 used)	.01
	114-294	6-20 x 1/4 Hex Head S.T. Screw Cad. Esc. Mounting	.02
	188-32	Retaining Ring	.01
	192-116	Dial Glass (8MF983)	.50
	S-15498	Tone Gear Bushing Set Screw and Sleeve Assy.	.12
	199-108	Vol. Control Shaft Sleeve (8MF983)	.02
	199-109	Tuning Shaft Sleeve	.02
	199-110	Volume Control Draft Sleeve	.02
	S-14215	Pointer Brkt. & Braid Assem.	.30
	S-14216	Pointer Drive Link & Stud Assy.	.15
	S-14281	Tuner Unit Assem.	11.50
	S-14300	Cross Arm & Bushing Assem.	1.00
	S-14301	Tuning Control Knob and Spring Assy. (8MM991)	1.00
	S-14302	Volume Control Knob and Spring Assy. (8MM991)	.40
	S-14304	Dial Light Socket & Wire Assy.	.35
	S-14308	Tone Drum Shaft & Gear Assy.	.50
	S-14333	Tuning Control Knob Assem. (8MF983)	1.00


6V6GT OUTPUT
6V6GT OUTPUT
6J5 GT INVERTER
6X5 GT RECTIFIER
6SQ7 GT DETECTOR
6SK7 GT I.F.
6SA7GT CONVERTER
6SK7 GT RF
MUTING SWITCH
TONE SWITCH S7 FRONT VIEW
S8 FRONT VIEW
VOLUME CONTROL
SK1 WIRING VIEW OF SPEAKER SOCKET
SP1 FRONT VIEW OF SPEAKER PLUG
SK2 SHORT WAVE CONVERTER SOCKET WIRING VIEW
NOTE: BOTH SWITCHES SHOWN IN LO NOISE POSITION. TURN CLOCKWISE TO HI FIDELITY, MUSIC AND SPEECH RESPECTIVELY.
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED
A - 25 VOLTS B - 100 VOLTS C - 200 VOLTS
D - 300 VOLTS E - 350 VOLTS F - 400 VOLTS
G - 500 VOLTS H - 600 VOLTS J - 1000 VOLTS
FOR RESISTORS K = 1000Ω, M = MEGOHM
ALL RESISTORS ARE 1/2 WATT ± 20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
DESIGNATES LOCATING RED DOT ON I.F. TRANS.
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT RF GRID AT 600 KC. & TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
27 MMFD SERIES AND 23 MMFD SHUNT AT ANTENNA SOCKET & .01 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
7.2 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH FIDELITY" POSITION
VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
I.F. 265 KC.
TUNING RANGE 540 KC TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS
U. S. A.

SCHEMATIC

PARTS LIST

Diag. No.	Part No.	Description	Price
		COILS AND CHOKES	
L2-3 L4-5	S-14295	Tuner Coil Unit Assem.	6.25
L8	S-14761	Motor Noise Choke Coil Assem.	.35
L7	S-14846	Osc. Shunt Coil Assem.	.85
	19-181	Coil Mounting Clip (Used on S-14846)	.06
L9	20-213	Main Hash Choke	.36
T1	95-1134	1st IF Transformer	1.60
T2	95-1135	2nd IF Transformer	1.85
L1	S-8819	Ant. Motor Noise Choke Assem.	.40
L6	S-14226	Osc. Series Coil Assem.	.35
L2-3	S-14227	Ant. & RF Coil Assem.	.90
L5	S-14228	Osc. Coil Assem.	.75
		CONDENSERS	
C5-11 C14	22-162	100 MMFD Mica 500V	.20
C23	22-182	220 MMFD Mica 500V	.26
C6	22-1136	250 MMFD Mica 500V	.20
C16	22-1137	150 MMFD 500V	.20
C34 C29	22-1238	.5 MFD 120V	.50
C30 C31	22-1484	Electrolytic 20 MFD 25V-20-20 400V MFD	2.10
C9	22-1712	260 MMFD Compensator	.50
C7	22-1715	Single Section Trimmer (Converter)	.35
C3-10	22-1722	Two Section Trimmer (RF & Osc.)	.60
C33	22-1728	.5 MFD. 100V	.55
C24	22-1748	.1 MFD (or 22-1906-22-170) 400V	.26
C25 C26	22-1750	.022 MFD (or 22-1908-22-992-22-1709) 600V	.26
C13	22-1751	.022 MFD 200V	.20
C2	22-1752	.0047 MFD (or 22-1022 22-1910) 600V	.26
C32	22-1771	.008 MFD (or 22-1448) 1600V	1.00
C4	22-1777	.1 MFD (or 22-190-22-1916) 200V	.26
C2	22-1783	.0047 MFD (or 22-906 22-1922) 400V	.20
C19	22-1784	.01 MFD (or 22-1466 - 22-1923-22-2014) 400V	.20
C22	22-1778	.047 MFD (or 22-1917) 200V	.26
C20	22-1785	.0015 (or 22-1743 22-1924) 400V	.20
C17	22-1949	560 MMFD Mica 300V	.30
C1	22-1960	Single Section Trimmer Antenna (8ML985-8ML985Z)	.55
C1	22-1961	Single Section Trimmer (Ant.) (8MF983-8MM991)	.55
C18	22-2046	.56 MFD (or 22-2047-22-2048 22-2049) 200V	.30
C27	93-686	Fibre Washer	.02
C27	64-4	Rivet	.01
C27	93-297	Metal Washers	.01
C27	27-87	Mica	.03
C27	57-1054	Plate	.10

Diag. No.	Part No.	Description	Price
		RESISTORS	
R2	63-1267	Sensitivity Control	.56
R35	63-1375	5.1 Ohm W.W. 2W 10% Ins. (8MF983)	.33
R32	63-1620	1800 Ohm (or 63-1691) 2W 10% Ins.	.36
R31	63-1622	330 Ohm (or 63-1692) 2W 10% Ins.	.36
R10	63-1624	15K Ohm 2W 10% Ins.	.36
R18	63-1654	Vol. Control & Tone Switch (or 63-1590)	2.50
R17	63-1729	47 Ohm 1/2 W 10% Ins.	.21
R-33 R-34	63-1740	82 Ohm 1/2 W. 10% Ins.	.21
R7	63-1782	820 Ohm 1/2 W. 10% Ins.	.21
R23	63-1785	1K Ohm 1/2 W 10% Ins.	.21
R17	63-1792	1500 Ohm 1/2 W 10% Ins.	.21
R23	63-1799	2200 Ohm 1/2W 10% Ins.	.21
R3	63-1827	10K Ohm 1/2 W 10% Ins.	.21
R5	63-1841	22K Ohm 1/2 W 10% Ins.	.21
R28	63-1852	39K Ohm 1/2W 10% Ins.	.21
R21	63-1855	47K Ohm 1/2 W 10% Ins.	.21
R5	63-1862	68K Ohm 1/2 W 10% Ins.	.21
R17	63-1862	68K Ohm 1/2 W 10% Ins.	.21
R19	63-1869	100K Ohm 1/2W 10% Ins.	.21
R14	63-1873	120K Ohm 1/2W 10% Ins.	.21
R13 R16 R27	63-1884	220K Ohm 1/2W 10% Ins.	.21
R30	63-1890	330K Ohm 1/2W 10% Ins.	.21
R1-4	63-1891	330K Ohm 1/2W 20% Ins.	.21
R9-11	63-1912	1 Megohm 1/2W 20% Ins.	.21
R22	63-1961	15 Megohm 1/2W 20% Ins.	.21
		MISCELLANEOUS	
	24-449	Power Pack Cover	
SP1	49-627	P.M.Speaker & Cable (6" x 9" Oval) (8MF983-8ML985-8MM991)	7.75
SP1	49-656	P.M. Speaker & Cable (6" x 9" Oval) (8ML985Z)	7.75
	52-451	Battery Cable - Fuse to Set	.35
	52-470	Speaker Cable & Plug	.45
	54-256	Speed Nut (Holds 52-451)	.02
	54-259	Speed Nut (2 used) (8MF983)	.10
	73-50	6-32 x 1/4" Headless Slotted Set Screw Cuppoint (used with S-15498)	.02
SK1	78-728	Speaker Socket	.20
	78-796	Antenna Connector Socket	.20
	78-801	Octal Base Tube Socket (4 used)	.15
	78-804	Vibrator Socket	.20
	78-836	Octal Tube Socket (2 used)	.15
	78-837	Octal Tube Socket (2 used)	.15
T3	95-1079	Output Transformer	4.00
T4	95-1143	Power Transformer	7.25
	149-63	Iron Core & Spring (4 used)	.40
V1	190-22	Vibrator	4.15
	196-91	Speaker Gasket (8MF983-8MM991-8ML985)	1.25
	196-110	Speaker Gasket (8ML985Z)	.08

Diag. No.	Part No.	Description	Price
	202-608	Interference Elimination Instruction Sheet (8MM991)	.08
	202-605	Interference Elimination Instruction Sheet (8MF983)	.08
	202-607	Interference Elimination Instruction Sheet (8ML985)	.08
	202-615	Interference Elimination Instruction Sheet (8ML985Z)	.08
	202-703	Instruction Book (Owner's Manual) (8MF983)	.12
	202-709	Instruction Book (Owners Manual) (8MM991)	.12
	202-705	Instruction Book (Owners Manual) (8ML985)	.12
	202-707	Instruction Book (Owners Manual) (8ML985Z)	.12
	12-1433	Set Installation Bracket (8ML985Z)	.10
	12-1549	Set Installation Bracket (8ML985)	.10
	S-14335	Installation Brkt. Assem (8MF983)	.25
	S-15340	Case Cover and Spring Assem. Wiring Section	
	S-15577	Case Cover and Spring Assem. Tube Section	
	S-15640	Receiver Case and Spark Plate Assembly (8MM991)	
	S-15641	Receiver case and spark plate Assembly (8MF983)	
	S-15644	Receiver Case & Spark Plate Assembly (8ML985)	
	S-15646	Receiver Case & Spark Plate Assembly (8ML985Z)	

TUNER UNIT

	S-14721	Clutch Plate & Washer Assy.	.65
	S-14727	Tuning Shaft, Pinion Gear & Coupling Assy.	.50
	S-14733	Muting Switch Assy.	.05
	17-102	Cam Lock	.03
	34-177	Clutch Gear	.70
	52-228	Cross Arm Guide Rod	.15
	64-162	.088 Dia. X 5/32" Rivet	.01
	73-118	6-32 X1/4" Hex.Hd.Slotted Set Screw (2 used)	.02
	80-640	Yoke Tension Spring (2 used)	.08
	80-641	Clutch Release Bar Spring	.01
	80-642	Clutch Spring	.02
S2	85-435	On-Off Switch	.50
	93-921	Tuning Shaft Steel Washer	.02
	93-922	Tuning Shaft Spring Washer	.02
	93-923	Fishpaper Washer (2 used)	.01
	97-305	Clutch Arm Stud	.03
	117-149	Clutch Lever	.15
	188-111	Retaining Ring (2 used)	.02
	S-14739	"Off" Button Assembly	.50
	S-15331	Push Button Assembly	.50

Diag. No.	Part No.	Description	Price

DIAL ASSEMBLY

	12-1435	Scale Retaining Bracket (8MM991-8ML985-8ML985Z)	.01
	12-1437	Dial Scale Mtg. Brkt (8MF983)	.08
	19-165	Insulating Bushing Tension Clip (Cross Arm)	.03
	19-167	Window Retaining Clip (R.H.) (8MF983)	.03
	19-168	Window Retaining Clip (L.H.) (8MF983)	.03
	26-392	Dial Scale (8ML985-8ML985Z)	3.00
	26-409	Dial Scale (8MF983)	.90
	26-412	Dial Scale (8MM991)	3.00
	46-701	Tone Control Knob	.45
	46-711	Tone Control Knob	.55
	57-1338	Escutcheon (8ML985-8ML985Z)	2.00
	57-1339	Escutcheon (8MM991)	2.50
	S-14658	Escutcheon Assembly (8MF983)	.50
	57-1344	Dial Background Plate (8MM991)	.12
	57-1356	Dial Background Plate (8ML985-8ML985Z)	.60
	80-232	Knob Retaining Spring	.02
	80-586	Cross Arm Tension Spring (2 used)	.07
	80-625	Pointer Link Tension Spring	.08
	80-651	Pointer Retaining Spring	.03
	83-1523	Dial Scale Filter Strip (8MF983)	.15
	83-1564	Felt Strip (8MM991)	.15
	83-1576	Felt Strip (8ML985-8ML985Z)	.15
	83-1583	Felt Strip (Used on Esc.) (8MF983)	.10
	94-607	Tuning Shaft Bushing (8MF983)	.20
	94-609	Cross Arm Insulating Bushing	.05
	94-608	Vol. Control Bushing (8MF983)	.20
	100-36	Dial Light Bulb (2 used)	.09
	112-699	4-40 X 3/16" R.H.S.T. Screw Steel Cad (4 used)	.01
	114-294	6-20 x 1/4 Hex Head S.T. Screw Cad. Esc. Mounting	.02
	188-32	Retaining Ring	.01
	192-116	Dial Glass (8MF983)	.50
	S-15498	Tone Gear Bushing Set Screw and Sleeve Assy.	.12
	199-108	Vol. Control Shaft Sleeve (8MF983)	.02
	199-109	Tuning Shaft Sleeve	.02
	199-110	Volume Control Draft Sleeve	.02
	S-14215	Pointer Brkt. & Braid Assem.	.30
	S-14216	Pointer Drive Link & Stud Assy.	.15
	S-14281	Tuner Unit Assem.	11.50
	S-14300	Cross Arm & Bushing Assem.	1.00
	S-14301	Tuning Control Knob and Spring Assy. (8MM991)	1.00
	S-14302	Volume Control Knob and Spring Assy. (8MM991)	.40
	S-14304	Dial Light Socket & Wire Assy.	.35
	S-14308	Tone Drum Shaft & Gear Assy.	.50
	S-14333	Tuning Control Knob Assem. (8MF983)	1.00

Diag. No.	Part No.	Description	Price
	S-14320	Tuning Control Knob Assem. (8ML985-8ML985Z)	1.00
	S-14321	Volume Control Knob Assem. (8ML985-8ML985Z)	.50
	S-14334	Volume Control Knob & Spring Assem. (8MF983)	.50
	S-14534	Tuner Unit Assem. (Complete) (8MM991)	7.50
	S-14281	Tuner Unit Assem. (Complete) (8MF983)	7.50
	S-14568	Tuner Unit Assem. (Complete) (8ML985-8ML985Z)	7.50
	S-14659	Dial Light Socket & Wire Assem. (8MF983)	.30
	S-14660	Dial Light Socket & Wire Assy. (8MF983)	.30
	S-14304	Dial Light Socket & Wire Assy. (8MM991-8ML985-8ML985Z)	.35
	59-208	Dial Pointer (8MM991-8ML985 8ML985Z)	.40
	S-14760	Dial Pointer Assem. (59-210) (8MF983)	.50
	S-15832	Dial Pointer & Sleeve Assem. (8ML985-8ML985Z)	
	S-14836	Tone Drum Shaft & Gear Assy. (8MF983)	.80
	S-14308	Tone Drum Shaft & Gear Assy. (8MM991-8ML985-8ML985Z)	.50

INSTALLATION AND MOTOR NOISE SUPPRESSION KITS

Diag. No.	Part No.	Description	Price
	S-14284	Installation Kit Assy (8MM991)	.80
	S-14285	Motor Noise Suppression Kit (8ML985-8ML985Z)	2.50
	S-14317	Installation Kit Assy. (Complete) (8ML985)	.70
	S-15820	Installation & Suppression Kit Assy. (8MF983)	3.00
	12-1550	Set Installation Bracket (8MM991)	.10
	S-14325	Installation Kit Assembly (8ML985Z)	.70
	22-1601	Generator Capacitor	1.20
	22-1767	Ignition Coil Capacitor	1.00
	52-458	Battery Cable - Fuse to Ammeter	.40
	54-157	1/4-20 x 7/16"x 3/16" Hex. Nut Steel Cad. Pl. (2 used)	.07
	54-189	#8-32 Wing Nut (4 used)	.02
	54-266	1/2-28 x 1/4" Hex. Palnut Cad. Pl. (2 used) (8MF983)	.04
	63-1046	Distributor Suppressor	.31
	69-27	8-32 x 5/8" R.H.M.S.Steel N.P. (8MM991)	.01
	80-145	Motor Hood Bonding Spring (8MF983)	.02
	80-579	Motor Hood Bonding Spring (8MM991-8ML985-8ML985Z)	.02
	93-161	1/4" External Shakeproof Lock-washer (2 used)	.01
	93-263	1/32" x 3/16" x 1/2 Washer Steel Cad. Pl.	.01
	93-577	062 X 17/64 x 3/4 Washer Steel Cad. Pl.(8MF983)	.02
	112-365	8 x 1/2"B.H. Sheet Metal Screw Type "A" Cad. Pl.	.02
S5	136-11	14 Amp. Fuse - Type SFE-14	.12

All prices shown are suggested list prices and subject to change without notice.

SERVICE MANUAL

Models
GL892
Lincoln Part No.
OL-18805-A
and
GL-892E
Lincoln Part No.
OL-18805-B

ZENITH
LONG DISTANCE AUTO RADIO

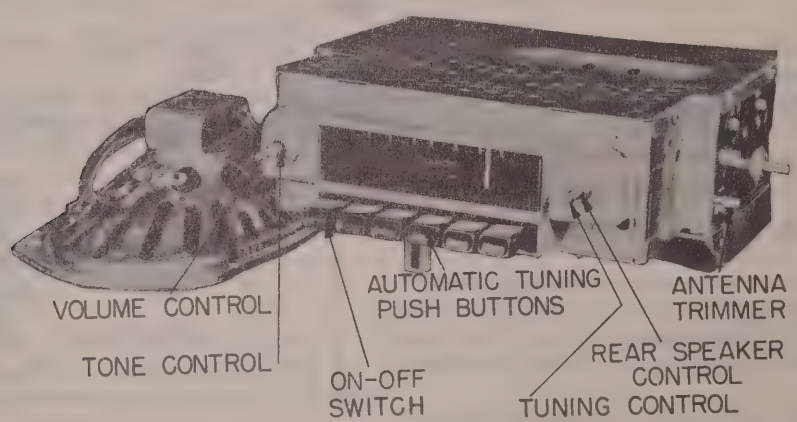
Models
GM891
Mercury Part No.
OM-18805-A
and
GM891E
Mercury Part No.
OM-18805-B

Models
GF890
Ford Part No.
OA-18805-B
and
GF890E
Ford Part No.
OA-18805-C

ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Fig. 1

Model GM891



These receivers are all identical electrically except export models, identified by the suffix "E" in the model number, which have a socket on the rear of the receiver case to accommodate an especially designed shortwave converter. For service information regarding the converter, see the converter Owners Manual.

Mechanically, there is a difference in the control knobs, the escutcheon and dial assemblies and the method of mounting the sets and speakers in the cars.

Electrical Specifications

SPEAKER: ..... 6" x 9" oval, instrument panel mounting.

CURRENT CONSUMPTION: ..... 8 amperes

TUBE COMPLEMENT: 6SK7GT R.F., 6SA7GT converter, 6SK7GT I.F., 6SQ7GT detector and 1st audio 6J5GT phase-inverter, 2-6V6GT push pull power output, and 6X5GT rectifier.

TUNING RANGE: ..... 540-1600 Kc.

INTERMEDIATE FREQUENCY: ..... 265 Kc.

SENSITIVITY: ..... 5 microvolts at one watt output

UNDISTORTED POWER OUTPUT: .....
6 watts measured at the voice coil.

Form FLM-50

Printed in U.S.A.—5M—CPC—12-49

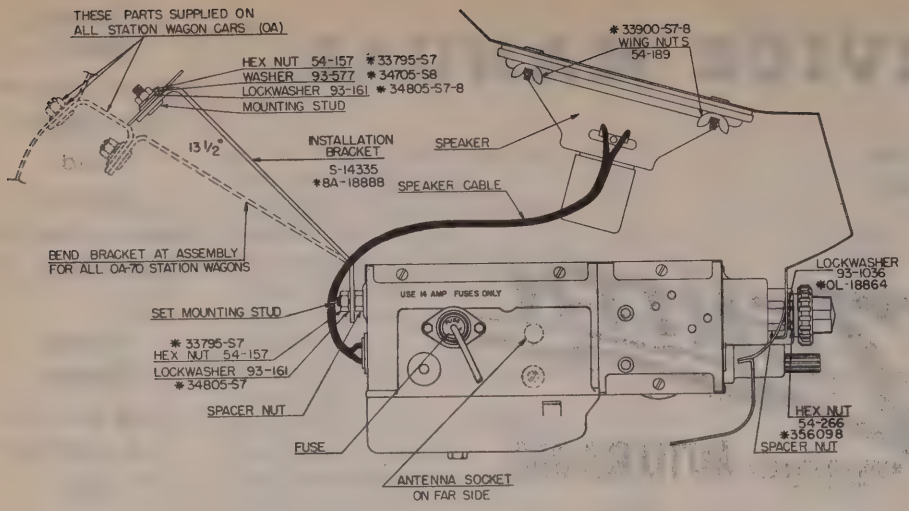


Fig. 2
FORD-MODEL GF890

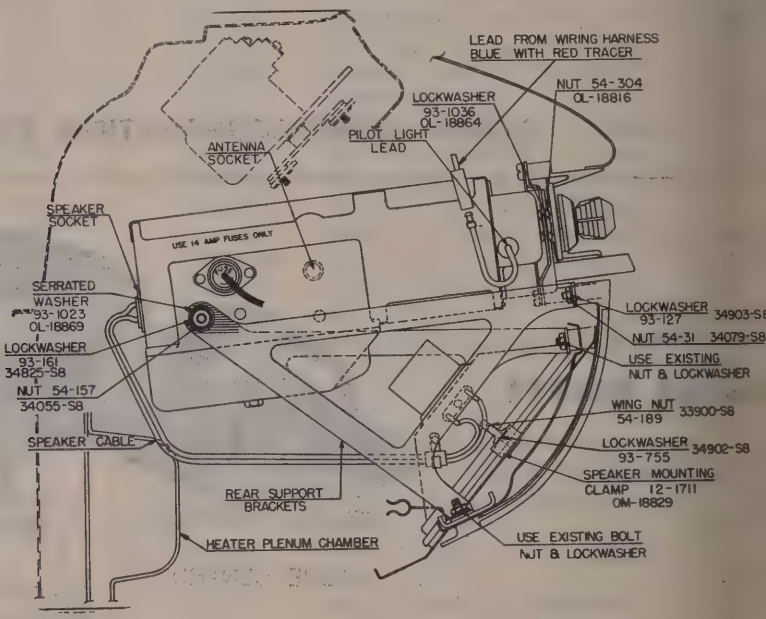
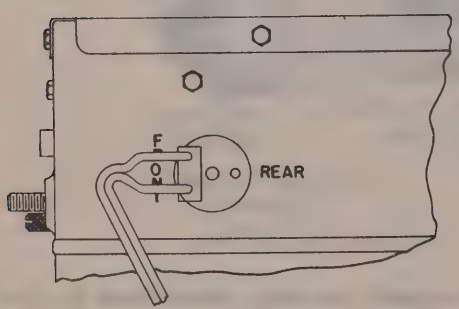
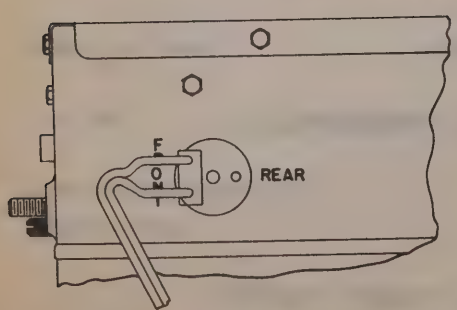


Fig. 3
MERCURY-MODEL GM891





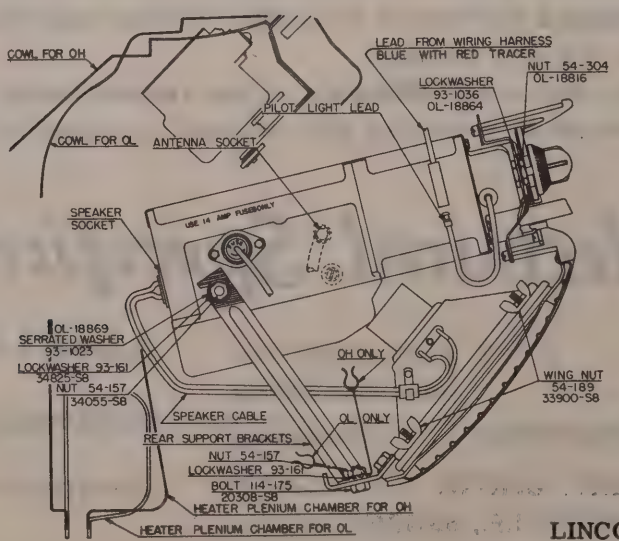


Fig. 4
LINCOLN-MODEL GL892

RECEIVER INSTALLATION

Figures 2, 3 and 4 illustrating the installed receivers are given here to facilitate removal and re-installation of the receivers when service is necessary.

TO TAKE THE RECEIVER FROM THE FORD CAR:

1. Disconnect the "A" lead at the receiver. Remove the speaker plug from the receiver. Disconnect the pilot light lead from the wiring harness, and disconnect the antenna lead from the receiver.

2. Remove control knobs, front mounting nuts and lockwashers from radio control shafts. (Fig. 2)

3. Disconnect the bottom of the set rear mounting bracket by removing the hex nut and lockwasher from the set rear mounting stud. (Fig. 2)

4. Remove set by pushing it back and down behind instrument panel.

5. To take the speaker from the Ford car, remove the four wing nuts that hold the speaker to the rear of the instrument panel.

TO TAKE THE RECEIVER FROM THE MERCURY CAR:

1. Remove the car heater plenum chamber. Loosen the nut holding the defroster control wire bracket and rotate the bracket to a vertical position. On some cars the bracket is not rotatable and it will be necessary to loosen and move the defroster adapter front cover to allow removal of radio. (It will be necessary to loosen the glove box to gain access to the mounting screws of the front cover).

2. Disconnect the "A" lead at the receiver. Remove the speaker plug from the receiver. Disconnect the pilot light lead from the wiring harness, and disconnect the antenna lead from the receiver.

3. Loosen the two speaker mounting clamps and remove the speaker.

4. Remove radio control knobs, bushing nuts, and lockwashers (Fig. 3).

5. Loosen the rear-side support brackets, and take the receiver from the car (Fig. 3).

TO TAKE THE RECEIVER FROM THE LINCOLN CAR:

1. Remove the heater plenum chamber.

2. Disconnect the "A" lead at the receiver. Remove the speaker plug from the receiver. Disconnect the pilot light lead from the wiring harness, and disconnect the antenna lead from the receiver. (Fig. 4)

3. Remove control knobs, control discs, front mounting nuts and lockwashers.

4. Loosen the rear side support brackets, and take the receiver from the car.

5. To take the speaker from the car - remove the four wing nuts #54-189 (Fig. 4). Carefully pull the speaker away from the four mounting studs.

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push-buttons. Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push-button. (Fig. 1).

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Fig. 1) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Fig. 1)

TONE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

REAR SPEAKER CONTROL

The rear speaker control disc, located behind the tuning control knob on the Lincoln and Mercury receivers is provided to control an auxiliary rear shelf speaker (available from the Lincoln Dealer).

The speaker socket located on the rear of the receiver case will accommodate both the front speaker and the rear speaker. When the rear speaker is plugged into the socket, a switch in the socket, connects the rear speaker control into the circuit.

AUTOMATIC TUNING

Automatic push-button tuning is provided by means of 5 push-buttons located directly under the dial scale and to the right of the "Off" push-button (Fig. 1). These five buttons permit the selection of five favorite local stations. When the push-buttons have been set to the desired stations it is only necessary to press a push-button to receive the station for which the adjustment was made. The dial pointer will automatically indicate the frequency of the selected station.

SETTING THE PUSH-BUTTON TUNER

The five push-buttons may be adjusted to any of the desired stations. In order to simplify the identification of these stations, it is advisable to set the push-buttons in sequence according to their frequencies, beginning with the station broadcasting on the lowest frequency and progressing to the station broadcasting on the highest frequency.

The push-buttons should be set up during the daytime because at night, distant stations will be heard with the

same volume as local stations, making it difficult to identify local stations.

Allow the receiver to operate for at least fifteen minutes before adjusting the push-buttons. This will allow each part in the receiver to reach normal operating temperature.

TO SET THE PUSH-BUTTONS, PROCEED AS FOLLOWS:

1. GF890:

   a. Collapse the antenna.

   b. Loosen the first push-button on the left by turning it, with your fingers, counter-clockwise one turn.

   c. Select the station desired and, with low volume, tune it in by turning the manual tuning knob. Tune very carefully for clearest reception.

   d. Press the first push-button in firmly, then release and tighten as much as possible by turning clockwise with your fingers.

   e. The first push-button is now set for this station selection. Follow the above procedure for setting each of the other four buttons.

2. GL892 - GM891

   a. Collapse the antenna.

   b. Tune in the station desired with the manual tuning knob.

   c. Pull the button, to be set, to the left and outward, then push the button completely in. The first push-button is now set for the desired station.

   d. Follow the above procedure for each of the other four push-buttons.

When the five push-buttons have been set to the desired stations, return the antenna to the lowest position necessary for good reception. It is only necessary to press a push-button to receive the station for which the adjustment was made. The dial pointer will automatically indicate the frequency of the selected station.

INTERFERENCE ELIMINATION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with the receiver. The interference suppression equipment may be checked for proper installation by referring to the following instructions:

1. On Ford Export, and Mercury, the hood bonding spring No. 80-579 should be installed on the cowl at the location shown in figure 5.

2. The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 6)

3. The suppressor, No. 63-1046, should be in the high tension wire, that connects the ignition coil to the center hole in the distributor cap approximately 1-1/2 inches from the cap. (Fig.7)

4. The ignition coil condenser, No. 22-1767, should be connected to the BAT. terminal of the ignition coil. (Fig. 8)

5. Be certain the anti-static powder is injected into the inner tubes and the static collector springs are installed in the inner hub caps. (Fig. 5)

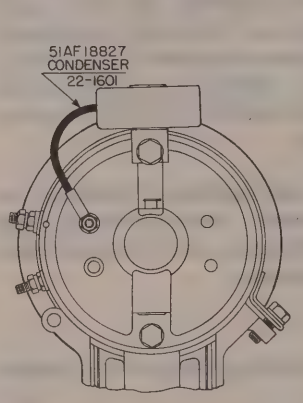


Fig. 6

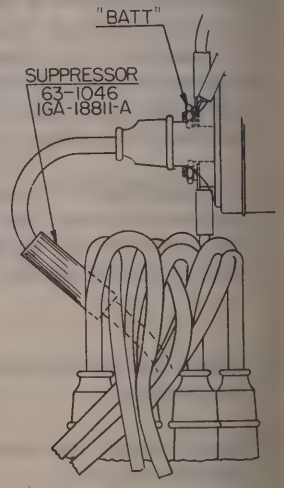


Fig. 7

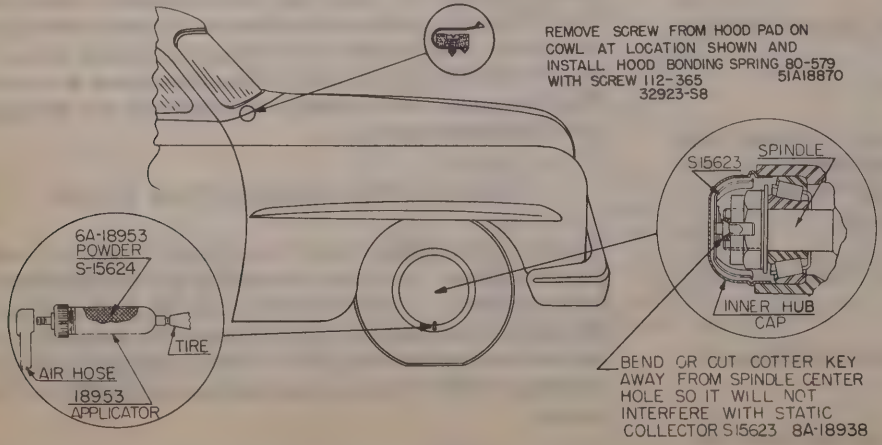


Fig. 5

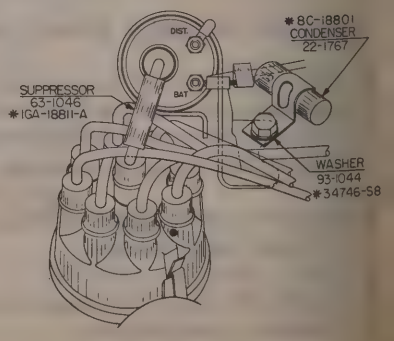


Fig. 8

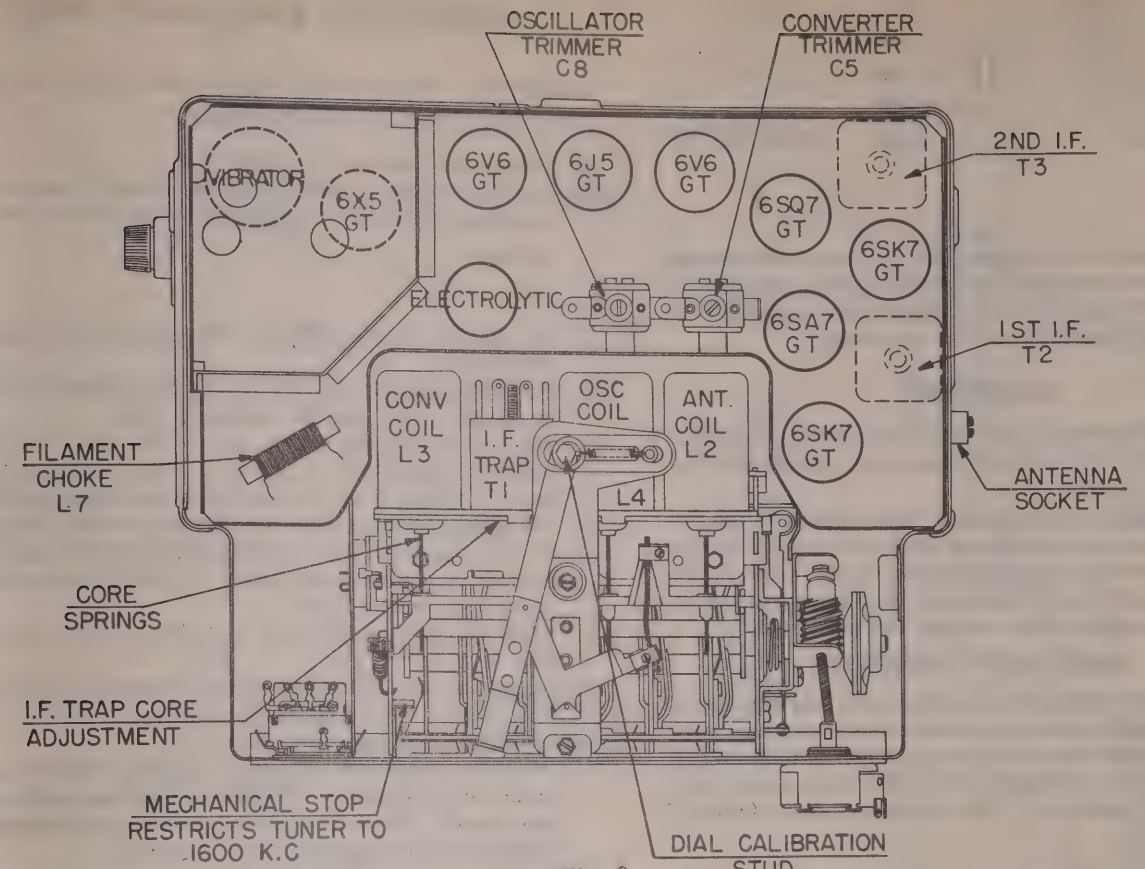

OSCILLATOR TRIMMER C8
CONVERTER TRIMMER C5
2ND I.F. T3
1ST I.F. T2
ANTENNA SOCKET
VIBRATOR
6X5 GT
6V6 GT
6J5 GT
6V6 GT
6SQ7 GT
6SK7 GT
6SA7 GT
6SK7 GT
ELECTROLYTIC
CONV COIL L3
I.F. TRAP T1
OSC COIL L4
ANT. COIL L2
FILAMENT CHOKE L7
CORE SPRINGS
I.F. TRAP CORE ADJUSTMENT
MECHANICAL STOP RESTRICTS TUNER TO 1600 K.C
DIAL CALIBRATION STUD

Fig. 9

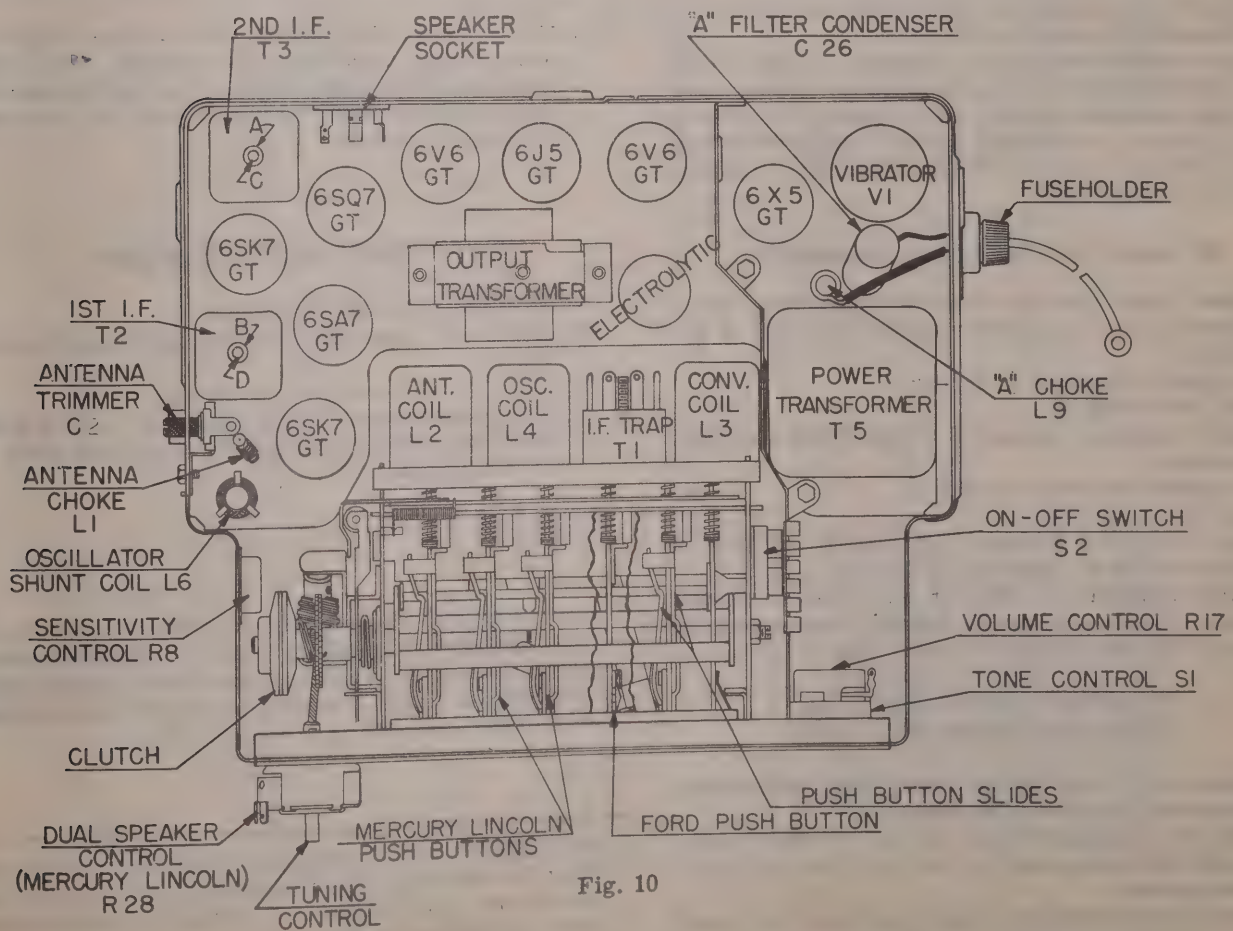

2ND I.F. T3
SPEAKER SOCKET
"A" FILTER CONDENSER C 26
FUSEHOLDER
"A" CHOKE L9
1ST I.F. T2
ANTENNA TRIMMER C 2
ANTENNA CHOKE L1
OSCILLATOR SHUNT COIL L6
SENSITIVITY CONTROL R8
CLUTCH
DUAL SPEAKER CONTROL (MERCURY LINCOLN) R 28
TUNING CONTROL
MERCURY LINCOLN PUSH BUTTONS
FORD PUSH BUTTON
PUSH BUTTON SLIDES
TONE CONTROL S1
VOLUME CONTROL R17
ON-OFF SWITCH S2
POWER TRANSFORMER T 5
VIBRATOR V1
6X5 GT
6V6 GT
6J5 GT
6V6 GT
6SQ7 GT
6SK7 GT
6SA7 GT
6SK7 GT
OUTPUT TRANSFORMER
ELECTROLYTIC
ANT. COIL L2
OSC. COIL L4
I.F. TRAP T1
CONV. COIL L3

Fig. 10

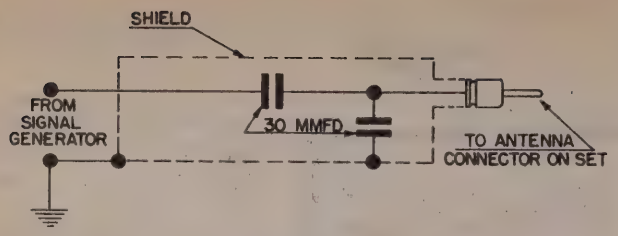


Fig. 11

Figure 11 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the RF section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

SENSITIVITY CONTROL

The sensitivity control R8 is factory pre-set and should not be readjusted unless the control has been tampered with. If it is definitely determined that readjustment is necessary, set the control to obtain 3.5 volts at the cathode of the IF amplifier - (Pin 5 of the second 6SK7GT tube).

IF ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 6SA7GT converter grid. (Pin No. 8 on socket)
4. Adjust concentric primary and secondary IF cores A, B, C, and D in order named with alignment wrench 68-7 (Figs. 9 and 10) Repeat operation to assure accurate alignment.

RF AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 11, to antenna lead in socket on receiver.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-8 (Fig. 9) for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-5 (Fig. 9) and antenna trimmer C-2 for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric stud at fulcrum of dial pointer. (Fig. 9)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. With core alignment tool, part No. S-13064, break cement seal and screw the core in, or out, to the desired position.
3. After all adjustments or replacements are completed, be sure to re-cement core springs.

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made only after a core or coil is replaced.

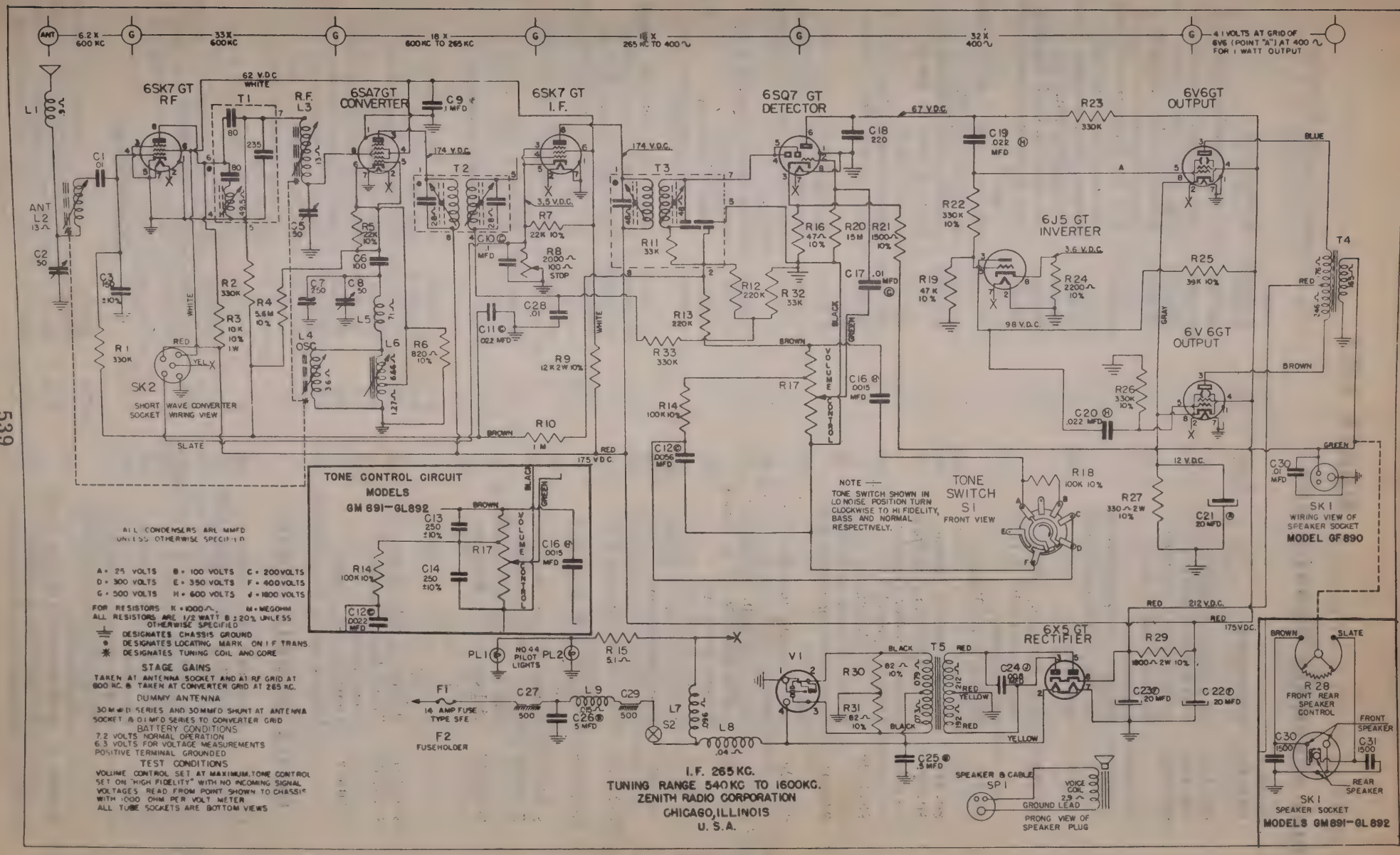
1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 11, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-8 (Fig. 9) at 1675 Kc.
6. Adjust the converter trimmer C-5 and antenna trimmer C-2 (Figs. 9 and 10) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about 11/16 of an inch from end end of the coil form).
9. Adjust the oscillator core L-4 (Fig. 10) to scale at 1300 Kc.
10. Adjust the antenna core L-2 and converter core L-3 (Fig. 10) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-6 (Fig. 10) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IF TRAP ADJUSTMENT

1. Set signal generator to 265 Kc.
2. Feed signal from generator through dummy antenna (Fig. 11.
3. Tune set to approximately 900 Kc.
4. Connect output meter across speaker voice coil and tune IF trap core with alignment wrench No. 68-7 for minimum output (Fig. 10).

In certain localities it may be necessary to shift the IF trap adjustment slightly in order to reject the interfering signal from a local station whose broadcasting frequency, or image frequency, is a few kilocycles higher or lower than 265.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.


ANT
6.2 X 600 KC
33X 600KC
18 X 600KC TO 265 KC
15 X 265 KC TO 400
32 X 400
41 VOLTS AT GRID OF 6V6 (POINT "A") AT 400 FOR 1 WATT OUTPUT
6SK7 GT RF
6SA7GT CONVERTER
6SK7 GT I.F.
6SQ7 GT DETECTOR
6J5 GT INVERTER
6V6GT OUTPUT
6V 6GT OUTPUT
6X5 GT RECTIFIER
62 V.D.C.
174 V.D.C.
67 V.D.C.
3.6 V.D.C.
98 V.D.C.
175 V.D.C.
212 V.D.C.
12 V.D.C.
SHORT WAVE CONVERTER SOCKET WIRING VIEW
SK2
TONE CONTROL CIRCUIT MODELS GM 891-GL892
TONE SWITCH S1 FRONT VIEW
NOTE — TONE SWITCH SHOWN IN LO NOISE POSITION TURN CLOCKWISE TO HI FIDELITY, BASS AND NORMAL RESPECTIVELY.
SK1 WIRING VIEW OF SPEAKER SOCKET MODEL GF890
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED
A = 25 VOLTS B = 100 VOLTS C = 200 VOLTS
D = 300 VOLTS E = 350 VOLTS F = 400 VOLTS
G = 500 VOLTS H = 600 VOLTS J = 1800 VOLTS
FOR RESISTORS K = 1000 M = MEGOHM
ALL RESISTORS ARE 1/2 WATT B ±20% UNLESS OTHERWISE SPECIFIED
DESIGNATES CHASSIS GROUND
DESIGNATES LOCATING MARK ON I.F. TRANS.
DESIGNATES TUNING COIL AND CORE
STAGE GAINS
TAKEN AT ANTENNA SOCKET AND AT RF GRID AT 600 KC. TAKEN AT CONVERTER GRID AT 265 KC.
DUMMY ANTENNA
30 MMFD SERIES AND 30 MMFD SHUNT AT ANTENNA SOCKET & .01 MFD SERIES TO CONVERTER GRID
BATTERY CONDITIONS
7.2 VOLTS NORMAL OPERATION
6.3 VOLTS FOR VOLTAGE MEASUREMENTS
POSITIVE TERMINAL GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM, TONE CONTROL SET ON "HIGH FIDELITY" WITH NO INCOMING SIGNAL
VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
ALL TUBE SOCKETS ARE BOTTOM VIEWS
I.F. 265 KC.
TUNING RANGE 540 KC TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS
U. S. A.
SPEAKER & CABLE SP1
VOICE COIL 2.9
GROUND LEAD
PRONG VIEW OF SPEAKER PLUG
R28 FRONT REAR SPEAKER CONTROL
FRONT SPEAKER
REAR SPEAKER
SK1 SPEAKER SOCKET MODELS GM891-GL892

SCHEMATIC

DIAL ASSEMBLY GM891-GL892

Diag. No.	Zenith Part No.	Description	Price
	*26-425	Dial Scale (GL892)	.60
	*26-431	Dial Scale (GM891)	.65
	*46-821	Tone Switch & Speaker Control Knob (2 used)	.40
	*57-1583	Escutcheon	1.15
	73-50	#6-32 x 1/4" Headless Sl. Set Screw Cuppoint (used on S-15498)	.02
	80-232	Knob Retaining Spring (used on S-16410, S-14333 and S-14334)	.02
	80-770	Pointer Pivot Tension Spring	.03
	80-778	Pointer Tension Spring	.10
	80-779	Cross Arm Tension Spring	.08
	93-1029	Special Washer (Pointer Tension Spring)	.01
	93-1036	1/2" Int. Shakeproof Lock-washer (2 used on 57-1583)	.02
	94-694	Cross Arm Insulating Bush-ing.	.08
	*94-708	Shaft Bushing (used on 57-1583)	.10
PL1-PL2	100-31	Dial Light Bulb (Mazda #55)	.08
	112-699	4-40 x 3/16" R.H.S.T. Screw (4 used on tuner)	.01
	114-200	#6-32 x 5/16" Hex.Hd.Sl. S.T. (6 used on 57-1583)	.01
	199-81	Tone Gear Sleeve	.02
	199-110	Vol. Control Shaft Sleeve	.02
	S-15498	Tone Gear, Bushing & Set Screw Assy.	.15
	*S-16168	Tone Drum Shaft & Gear Assy.	.50
	S-16272	Pointer Support Brkt.Assy.	.20
	S-16410	Tuning & Volume Control Knob & Spring Assy.(GM891)	.40
	*S-16449	Dial Scale Brkt & Socket Assy.	.20
	*S-16451	Pointer & Brkt. Assy.	.25
	*S-16483	Cross Arm, Bushing & Core Assy.	1.00
	S-16502	Tuning & Vol. Control Knob & Spring Assy.(GL892)	.50

DIAL ASSEMBLY GF890

Diag. No.	Zenith Part No.	Description	Price
	12-1437	Dial Scale Mtg. Brkt.	.08
	19-167	Window Retaining Clip (R.H)	.03
	19-168	Window Retaining Clip(L.H.)	.03
	*26-430	Dial Scale	.90
	46-711	Tone Control Knob	.55
	54-259	Special Nut (used on Esc.)	.10
	*57-1611	Escutcheon	5.00
	73-50	#6-32 x 1/4" Headless Sl. Set. Screw Cuppoint (used on S-15498)	.02
	80-232	Knob Retaining Spring (used on S-14333 & S-14334)	.02
	80-770	Pointer Pivot Tension Sprg.	.03

DIAL ASSEMBLY GF890 CONT'D

Diag. No.	Zenith Part No.	Description	Price
	80-778	Pointer Tension Spring.	.10
	80-779	Cross Arm Tension Sprg.	.08
	83-1523	Dial Scale Filter Strip	.15
	93-1029	Special Washer (Pointer Tension Spring)	.01
	93-1036	1/2" Int. Shakeproof Lock-washer (2 used on Esc.)	.02
	94-694	Cross Arm Insulating Bush.	.08
	94-709	Tuning Shaft Bushing	.20
	94-710	Vol. Control Shaft Bushing	.20
	100-36	Dial Light Bulb (Mazda #44) (2 used)	.09
	112-699	#4-40 x 3/16" R.H.S.T. Screw (4 used on Tuner)	.01
	114-200	#6-32 x 5/16" Hex.Hd Sl. S. T. (6 used on Esc.)	.01
	192-116	Dial Window	.50
	199-81	Tone Gear Sleeve	.02
	199-108	Vol. Control Shaft Sleeve	.02
	199-109	Tuning Shaft Sleeve	.02
	S-14333	Tuning Control Knob Assy.	1.00
	S-14334	Vol. Control Knob & Spring Assy.	.50
	S-15498	Tone Gear, Bushing & Set Screw Assy.	.15
	*S-16252	Tuner Unit Assy.	10.50
	S-16270	Pointer Drag Link & Stud Assy.	.30
	S-16272	Pointer Support Brkt. Assy.	.20
	S-16479	Dial Light Socket & Wire	.20
	S-16480	Dial Light Socket & Wire	.20
	S-16483	Cross Arm, Bushing & Core Assy.	1.00
	S-16557	Tone Drum, Shaft & Gear Assy.	1.00
	*S-16630	Pointer & Brkt. Assy.	.50

COILS AND CHOKES

L2	S-14227	Antenna Tuning Coil	.90
L3	S-14227	RF Tuning Coil	.90
L4	S-16699	Oscillator Tuning Coil	.75
L8	20-213	Main Hash Choke	.36
L9	20-292	Motor Noise Choke Coil	.20
T3	95-1135	2nd IF Transformer	1.85
T2	*95-1195	1st IF Transformer	1.60
T1	95-1196	IF Trap Coil	
L1	S-8819	Antenna Motor Noise Choke Coil	.40
L7	S-14761	Motor Noise Choke Assy.	.35
L5	S-16282	Oscillator Series Coil Assy.	.30
L6	S-16283	Oscillator Shunt Coil Assy.	.65
	*S-16485	Tuner Unit Coil Assy.	4.25

CONDENSERS

C28	22-3	.01 Mfd. Ceramic Disc. 500V	.26
C6	22-162	100 Mmfd. (Molded) 500V	.20
C18	22-182	220 Mmfd (Molded) 500V	.26
C3	22-733	100 Mmfd.(GF890)(GL892) (Molded) 500V	.26

CONDENSERS (CONT'D)

Diag. No.	Zenith Part No.	Description	Price
C3	22-734	150 Mmfd.(GM891) (Molded) 500V	.26
C14,13	22-1136	250 Mmfd. (Molded)500V	.20
C21,22) 23)	22-1484	Elect. Cond. - 20 Mfd. 25V 20 Mfd. 20 Mfd. 400V	2.10
C25,C26	22-1728	.5 Mfd. 100V	.55
C24	22-1771	.0082 Mfd.(or 22-1448) 1600V	1.00
C9	*22-2061	.1 Mfd. 400V	.35
C19,20	*22-1813	.022 Mfd. 600V	.26
C17	22-2213	.01 Mfd. 500V	.26
C11	*22-2071	.022 Mfd. 200V	.26
C10	*22-1777	.1 Mfd. 200V	.26
C16	*22-1785	.0015 Mfd. 400V	.26
C8	*22-2118	Osc. Trimmer Cond.	.35
C5	22-2119	Converter Trimmer Cond.	.40
C2	*22-2124	Antenna Trimmer Cond.	.40
C7	*22-2208	Compensating Cond.	.65
C12	(22-2046	.0056 Mfd. GF890 200V	.26
	(22-2161	.0022 Mfd. (or 22-2180) (Molded) (GM891 GL892) 200V	.26
C30,31	105-17	1500 Mmfd. 450V	
	(57-1597	Ground Plate	.05
	(57-1598	Top Ground Plate	.05
C27	(57-1602	Capacitor Plate	.04
C29	(57-1603	Capacitor Plate	.02
	(83-1690 (	Insulator Strip (3 used on sparkPlates)	.03

RESISTORS

R3	63-1071	10K Ohm 1W 10% Ins.Res.	.24
R9	63-1091	12K Ohm 2W 10% Ins.Res.	.33
R15	22-1375	5.1 Ohm 2W -GF890 Ins.Res.	.33
R29	63-1620	1800 Ohm 2W 10% Ins.Res.	.36
R22	63-1622	330 Ohm 2W 10% Ins. Res.	.36
R16	63-1729	47 Ohm 1/2W 10% Ins.Res.	.21
R30,31	63-1740	82 Ohm 1/2W 10% Ins.Res.	.21
R6	63-1782	820 Ohm 1/2W 10% Ins.Res.	.21
R21	63-1792	1500 Ohm 1/2W 10% Ins.Res.	.21
R24	63-1799	2200 Ohm 1/2W 10% Ins.Res.	.21
R5,R7	63-1841	22K Ohm 1/2W 10% Ins.Res.	.21
R32,11	63-1849	33K Ohm 1/2W 20% Ins.Res.	.21
R25	63-1852	39K Ohm 1/2W 10% Ins.Res.	.21
R19	63-1855	47K Ohm 1/2W 10% Ins.Res.	.21
R18,14	63-1869	100K Ohm 1/2W 10%Ins.Res.	.21
R12,13	63-1884	220K Ohm 1/2W 20% Ins.Res.	.21
R22,26	63-1890	330K Ohm 1/2W 10% Ins.Res.	.21
R23,33 1,2	63-1891	330K Ohm 1/2W 20% Ins.Res.	.21
R10	63-1912	1 Megohm 1/2W 10% Ins.Res.	.21
R4	63-1943	5.6 Ohm 1/2W 10% Ins.Res.	.21
R20	63-1961	15 Ohm 1/2W 20% Ins.Res.	.45
R8	63-2069	Sensitivity Control	
R28	*63-2085	Dual Speaker Control (GM891 & GL892)	3.01
R17,S1	63-2094	Vol. Control & Tone Switch (GM891 & GL892)	2.50
R17,S1	63-2092	Vol. Control & Tone Switch (GF890)	2.50

INSTALLATION & SUPPRESION KIT GL892

Diag. No.	Zenith Part No.	Description	Price
	*12-1682	Set Support Brkt. (L.H.)	.10
	12-1683	Set Support Brkt. (R.H.)	.10
	22-1601	Generator Cond.	1.20
	22-1767	Ignition Coil Cond.	1.00
	54-157	1/4-20x7/16x3/16 Hex Nut St. Cad. (4 used)	.07
	54-189	#8-32 Wing Nut (4 used)	.02
	63-1046	Distributor Suppressor	.31
	80-579	Motor Hood Bond Spring	.09
	93-161	1/4" Ext. Shakeproof Lock-washer (4 used)	.01
	*93-1023	Set Installation Washer (2 used)	.02
	112-365	#8x1/2" B.H. Sheet Metal Screw Cad. Pl.	.02
	114-175	1/4-20x1/2" Hex.Hd. M.S. Steel Zinc Plate	.01
	*202-799	Ignition Coil Capacitor Installation Sheet	.02
	S-15623	Wheel Ground Spring Assy. (2 used)	.65
	S-15624	Anti-Static Powder Kit Assy.	.75
	S-16492	Installation & Suppression Kit Assy. (Complete)	4.15

INSTALLATION & SUPPRESSION KIT GM891

	*12-1711	Speaker Mtg. Brkt.(2 used)	.03
	22-1601	Generator Capacitor	1.20
	22-1767	Ignition Coil Cond.	1.00
	54-31	10-32x3/8" Hex Nut - Steel N.P.	.01
	54-157	1/4-20x7/16x3/16 Hex Nut Steel (2 used)	.07
	54-189	#8-32 Wing Nut (2 used)	.02
	63-1046	Distributor Suppressor	.31
	93-127	#10 Int. Shakeproof Lock-washer	.01
	93-161	1/4" Ext. Shakeproof Lock-washer (2 used)	.01
	93-755	#8 Ext. Shakeproof Lock-washer (2 used)	.01
	* 93-1023	Set Installation Washer (2 used)	.02
	93-1044	1/16"x21/64"x11/16" Steel Washer Cad. Pl.	.02
	*202-798	Ignition Coil Capacitor Installation Sheet.	.02
	S-15623	Wheel Ground Spring Assy. (2 used)	.65
	S-15624	Anti-Static Powder Kit Assy.	.75
	*S-16532	Installation & Suppression Kit Assy. (Complete)	4.50

INSTALLATION & SUPPRESSION KIT GF890

	22-1601	Generator Capacitor	1.20
	22-1767	Ignition Coil Capacitor	1.00
	57-157	1/4-20 x 7/16"x3/16" Hex Nut St. Cad. Pl. (2 used)	.07
	54-189	8-32 Wing Nut (4 used)	.01
	63-1046	Distributor Suppressor	.31

Diag. No.	Zenith Part No.	Description	Price
	S-15624	Anti-Static Powder Kit Assy	.75
	S-16456	Installation & Suppress.Kit	5.00
	93-161	1/4" Ext. Shakeproof Washer	.01
	93-577	.062x17/64x11/16 Steel Washer Cad. Pl.	.02
	93-1044	1/16x21/64x11/16 Steel Washer Cad. Pl.	.02
	202-797	Ignition Coil Sheet	.02
	S-14335	Installation Brkt. Assy.	.25
	S-15623	Wheel Ground Spring Assy.	.65

MISCELLANEOUS

	S-16527	Set Mtg. Brkt. & Bushing Assy. (R.H.) (GM891)	.35
	12-1710	Set Mtg. Brkt. (GM891)	.40
	*49-679	6"x9" PM Speaker (GF890)	7.75
	49-675	6"x9" PM Speaker(GM891) (GL892)	7.75
	52-458	Battery Cable(Fuse to Amm.)	.40
F2	52-544	Battery Cable(Fuse to set)	.30
	52-470	Spkr. Cable Plug(GF890)	.45
	*52-551	Spkr. Cable & Plug(GM891 -GL892)	.35
	78-796	Antenna Connector Socket	.20
	78-801	Octal Tube Socket	.15
	78-804	Vibrator Socket	.20
	78-836	Octal Tube Socket	.15
	78-837	Octal Tube Socket	.15
SK1	78-728	Spkr Socket (GF890)	.20
SK1	*78-866	Spkr Skt.GM891-GL892	.40
	78-878	Octal Tube Socket	.20
	93-888	Vibrator Cushion Washer	.04
T4	95-1079	Output Transformer	4.00
T5	95-1144	Power Transformer	6.25
F1	*136-18	14 Ampere Fuse	.12
	149-94	Iron Core (3 used)	.35
V1	190-22	Vibrator	4.15
	*202-782	Owners Manual(GM891)	.05
	*202-786	Int. Sheet(GM891)	.03
	*S-16381	Spkr Control Cable Assy.	.15
	202-778	Owners Manual (GL892)	.15
	202-780	Int. Elim.Sheet(GL892)	.05
	*202-770	Int. Elim. Sheet(GF890)	.03
	*202-795	Instruction Book (GF890)	.10

TUNER PARTS GM891-GL892

	S-16253	Tuner Unit Assy.(GL892)	12.00
	S-16254	Tuner Unit Assy.(GM891)	13.00
	*12-1667	Worm Gear Brkt.	.06
	*34-197	Worm Gear	.65
	*46-822	Push Button Knob(GL892)	.15
	*46-823	OFF Button Knob(GL892)	.15
	*46-845	Push Button Knob	.30
	*46-849	OFF Push Button Knob	.30
	56-279	Release Bar Retaining Pin	.05
	57-1569	Front Guide Plate	.15
	73-21	#8-32x3/16" Headless Set Screw Cuppoint	.02
	73-115	#8-32x3/8" Slab Hd.Set Screw Cuppoint	.03
	76-567	Gear & Clutch Shaft	.15
	*76-579	Drive Shaft	.85
	80-638	Switch Plunger Return Sprg.	.06
	80-755	Plunger Spring (5 used)	.02
	80-757	Release Bar Spring	.09
	*80-773	Anti-Rattle Spring (On-Off)	.04
	80-783	Gear Tension Spring	.06
	*83-1715	Push Button Strip (6 used)	.01
S2	85-435	Switch	.50
	93-921	Tuning Shaft Washer	.02
	93-923	Fishpaper Washer	.01
	93-1024	Worm Gear Tension Washer	.02
	*93-1025	Cup Washer	.02
	93-1038	Felt Washer (5 used)	
	112-759	Pivot Screw	.04
	112-785	Worm Retaining Screw	.04
	184-14	Steel Ball 1/8" Dia.(11 used)	.01
	188-111	Retaining Ring	.02
	*S-16103	Tuner Plunger Assy.(5 used)	.70
	S-16285	Gear & Bushing Assy.	.65
	*S-16293	Clutch Release Brkt. &Assy.	.25
	S-16297	Clutch Plate & Washer	.65
	*S-16551	Release Bar & Roller Assy	.20

TUNER PARTS GF890

	12-1667	Worm Gear Brkt.	.06
	34-197	Worm Gear	.65
	56-279	Release Bar Retaining Pin	.05
	73-21	#8-32x3/16" Headless Sl.Set Screw Cuppoint	.02
	73-115	#8-32x3/8" Slab Hd. Set Screw Cuppoint (2 used)	.03
	*76-565	Drive Shaft	.80
	80-638	Switch Plunger Return Sprg.	.06
	80-755	Plunger Spring (5 used)	.02
	*80-756	Switch Latch Spring	.06
	80-757	Release Bar Spring	.09
	80-773	Anti-Rattle Spring(On-Off)	.04
	80-783	Gear Tension Spring	.06
	*80-786	Clutch Release Brkt.Sprg.	.06
	*80-788	Clutch Release Spring	.02
	85-435	Switch	.50
	93-921	Tuning Shaft Washer	.02
	93-923	Fishpaper Washer (2 used)	.01
	93-1009	Spring Washer	.02
	93-1024	Worm Gear Tension Washer	.02
	93-1025	Cup Washer	.02
	*93-1038	Felt Washer (5 used)	.02
	93-1041	Shim Washer	.02
	*97-368	Switch Lock Stud	.02
	112-785	Worm Retaining Screw	.04
	184-14	Steel Ball 1/8" Dia.	.01
	188-111	Retaining Ring	.02
	*S-16252	Tuner Unit Final Assy.	10.50
	S-16285	Gear & Bushing Assy.	.65
	S-16289	Treadle Assy.	1.00
	S-16291	Plunger & Cam Assy.	.75
	S-16293	Clutch Release Brkt. & Roller Assy.	.25
	S-16297	Clutch Plate & Washer Assy	.65
	*S-16360	Plunger Screw & Knob	.50
	*S-16377	Release Bar & Roller Assy	.25
	*S-16380	Switch Plunger & Knob Assy.	.50

*Denotes parts not previously used in Zenith receivers.

Prices shown are suggested list prices and are subject to change without notice.

THE ROYALTY OF RADIO

SERVICE MANUAL

Models
GH694
GH694Z

ZENITH
•LONG DISTANCE• AUTO RADIO

Hudson Part No.
H.A. 221940

Made by ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, U.S.A.

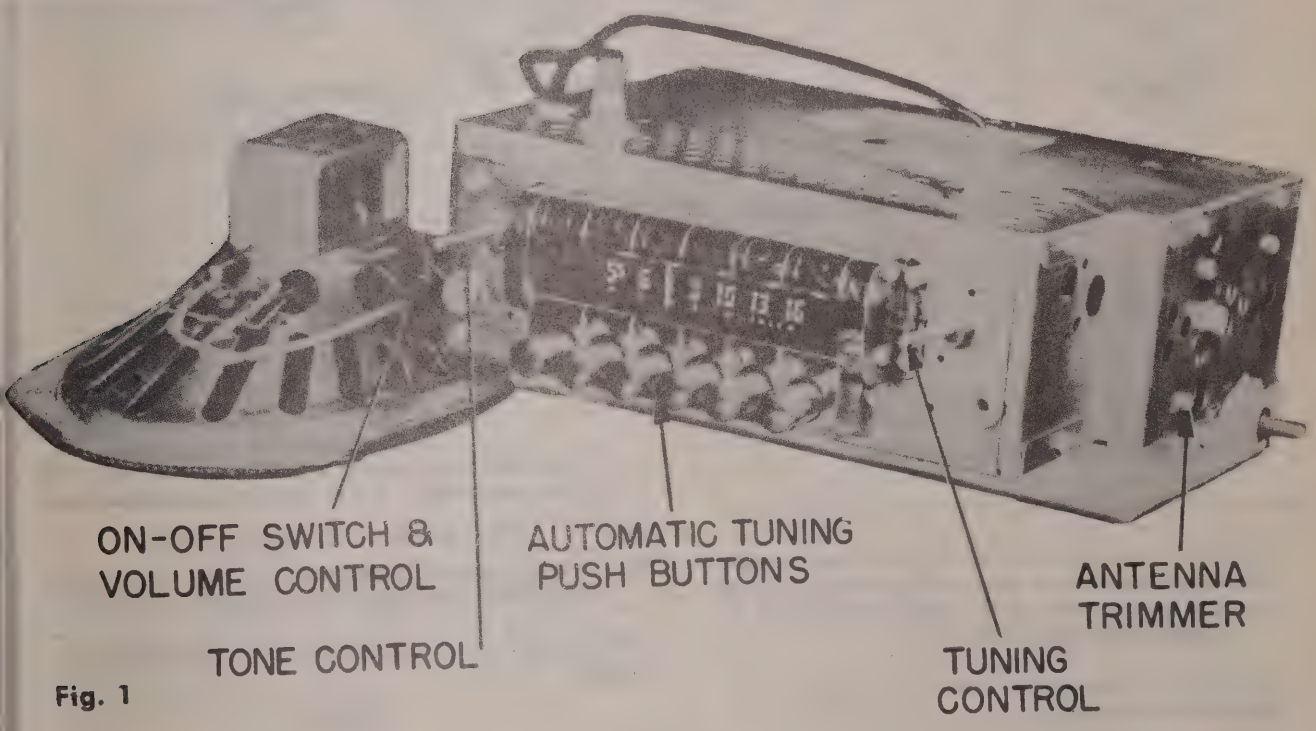


Fig. 1

Electrical Specifications

SPEAKER.....6" x 9" oval, instrument panel mounting.

CURRENT CONSUMPTION:.....6 amperes

TUBE COMPLEMENT: 6SK7GT R.F., 6SA7GT converter, 6SK7GT I.F., 6SQ7GT detector and 1st audio, 6V6GT power output, and 6X5GT rectifier.

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....4 microvolts at one watt output

UNDISTORTED POWER OUTPUT:.....
Max. (4.5) watts measured at the voice coil.

Form H-50

Printed in U.S.A.—5M—R—12-49

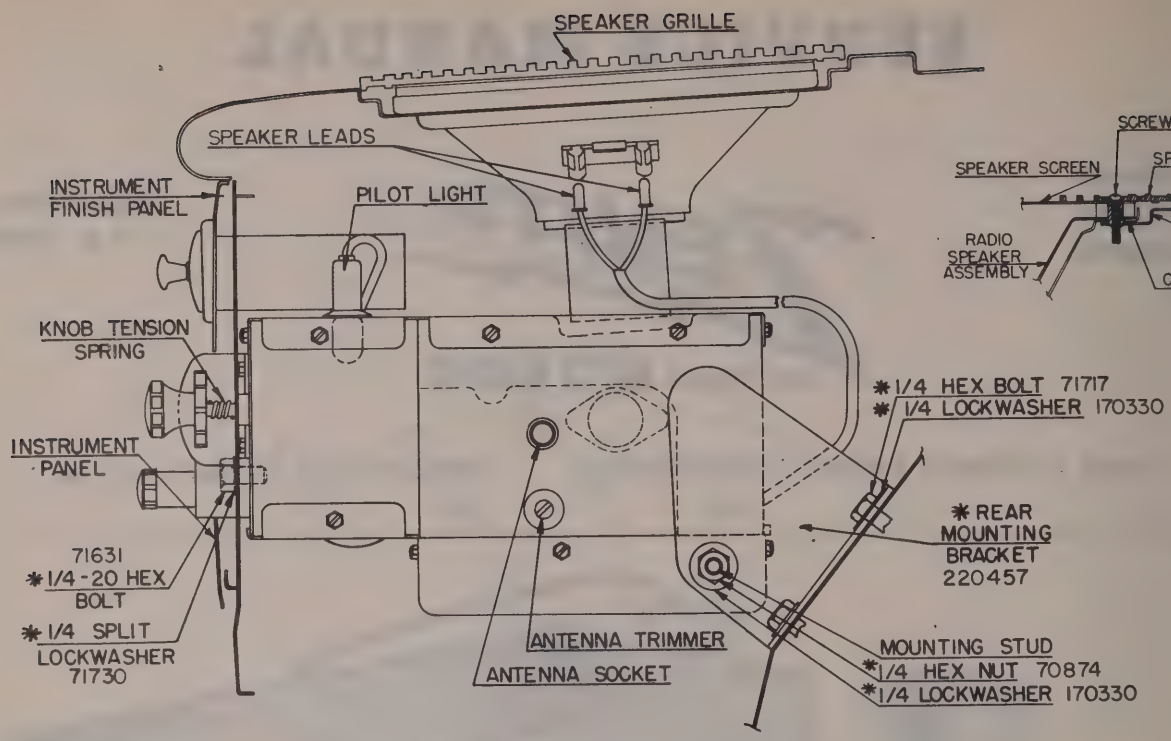


Fig. 2

RECEIVER INSTALLATION

Figures 1 and 2, illustrate the installed receiver.

1. To take the receiver from the car, open door on left hand side of instrument panel by removing the screw at top of door. Open glove compartment door on right side of instrument panel.

2. Remove tone control, volume control, tuning and trim knobs from set.

3. Remove ornament from center of trim panel above radio opening by means of removing the two face screws.

4. Remove the instrument finish panel by taking out the four screws that hold it to the instrument panel.

5. Remove the four chrome plated screws holding speaker into position and raise speaker. Disconnect speaker leads from speaker and take out speaker. (Fig. 2)

6. Disconnect antenna lead from set.

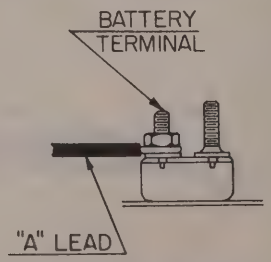
7. Disconnect set "A" lead from fuseholder.

8. Remove the two front 1/4 x 20 x 1/2 fillister head screws and lockwashers from set front. (Fig. 2)

9. Loosen rear set mounting bracket from set rear stud bolt by removing 1/4 x 20 hex nut and lockwasher. (Fig. 2)

10. Remove receiver by pushing set down and back between instrument panel and air hopper. (Fig. 2)

To reinstall receiver in car, reverse the preceding 10 steps.



"A" LEAD CONNECTION

Fig. 3

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1400 Kc.

OPERATING INSTRUCTIONS
OFF-ON SWITCH AND VOLUME CONTROL

To turn the receiver on, turn the volume control knob to the right until it clicks and the dial is illuminated. Allow the receiver to reach operating temperature. (Approximately 20 seconds.) To increase the volume, continue to turn this control knob to the right. To turn the receiver off turn the volume control knob to the left until it clicks.

TONE CONTROL

The tone control is located directly behind the volume control knob (Fig. 1). Rotating this control to the right or left will change the tone of the receiver. Tuning to the right will emphasize the high notes, while turning to the left will emphasize the bass notes.

MANUAL TUNING

To tune manually it is only necessary to turn the manual tuning knob (on the right side of the receiver, see Fig. 1.) Tune to exact frequency for the best tone quality. This can be done at any time without disturbing the automatic setting.

AUTOMATIC TUNING

There are six automatic tuning positions, each of which may be adjusted to any desired station. In order to simplify the identification of the stations, it is advisable to set the automatic tuning mechanism in sequence according to frequencies of the stations, beginning with the station broadcasting on the lowest frequency, and progressing to the station broadcasting on the highest frequency. If the positions have not been previously adjusted, proceed as follows:

1. Loosen the first push button by turning it counter-clockwise with your fingers, not more than two turns.
2. Turn the manual tuning control knob (Fig. 1) to tune in the desired station. Carefully tune to the middle of the signal for clearest reception.
3. Push the first push button in as far as it will go. Release the button, and tighten securely by turning it clockwise with the fingers.
4. Repeat the above procedure for the remaining five push buttons.

IMPORTANT: Turn the receiver on and allow it to operate for approximately fifteen minutes in order for it to reach normal operating temperature. Tune in a weak station near 1200 Kc. With a small screw driver adjust the antenna trimmer, located on the right side of the receiver for maximum volume (Fig. 2).

INTERFERENCE ELIMINATION

IMPORTANT: Use the utmost care in the following operations to insure freedom from motor noise. Be sure that good ground contacts are made between the interference condensers and the car body. If necessary, clean away paint or dirt with emery paper. Tighten all nuts and bolts securely.

1. Remove the mounting screw of the voltage regulator and under this screw mount the condenser No. 22-1537. Connect the lead to the voltage regulator "ARM." terminal. (Fig. 4)
2. Cut the high tension wire that runs from the ignition coil to the center hole of the distributor cap, one and one half inch from the cap. Cut one inch from the coil end of the wire. Remove the wire from the coil, and screw the cut end of the wire into the suppressor number 63-1046. Screw the other end of the suppressor to the cut end of the distributor wire. Replace the wire in the coil. (Fig. 5)
3. Remove bolt on the right side of the ignition coil. Mount condenser No. 22-1537 under this bolt. Connect lead to coil terminal marked (-). (Fig. 6)

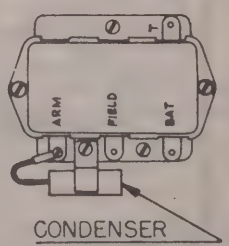


Fig. 4

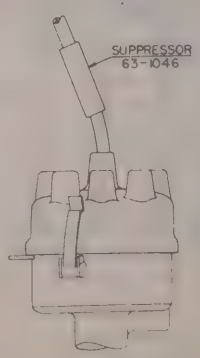


Fig. 5

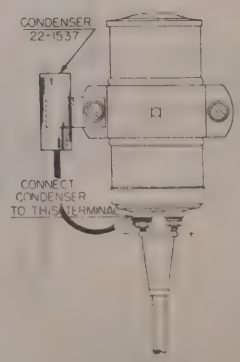


Fig. 6

* HUDSON PART NO.

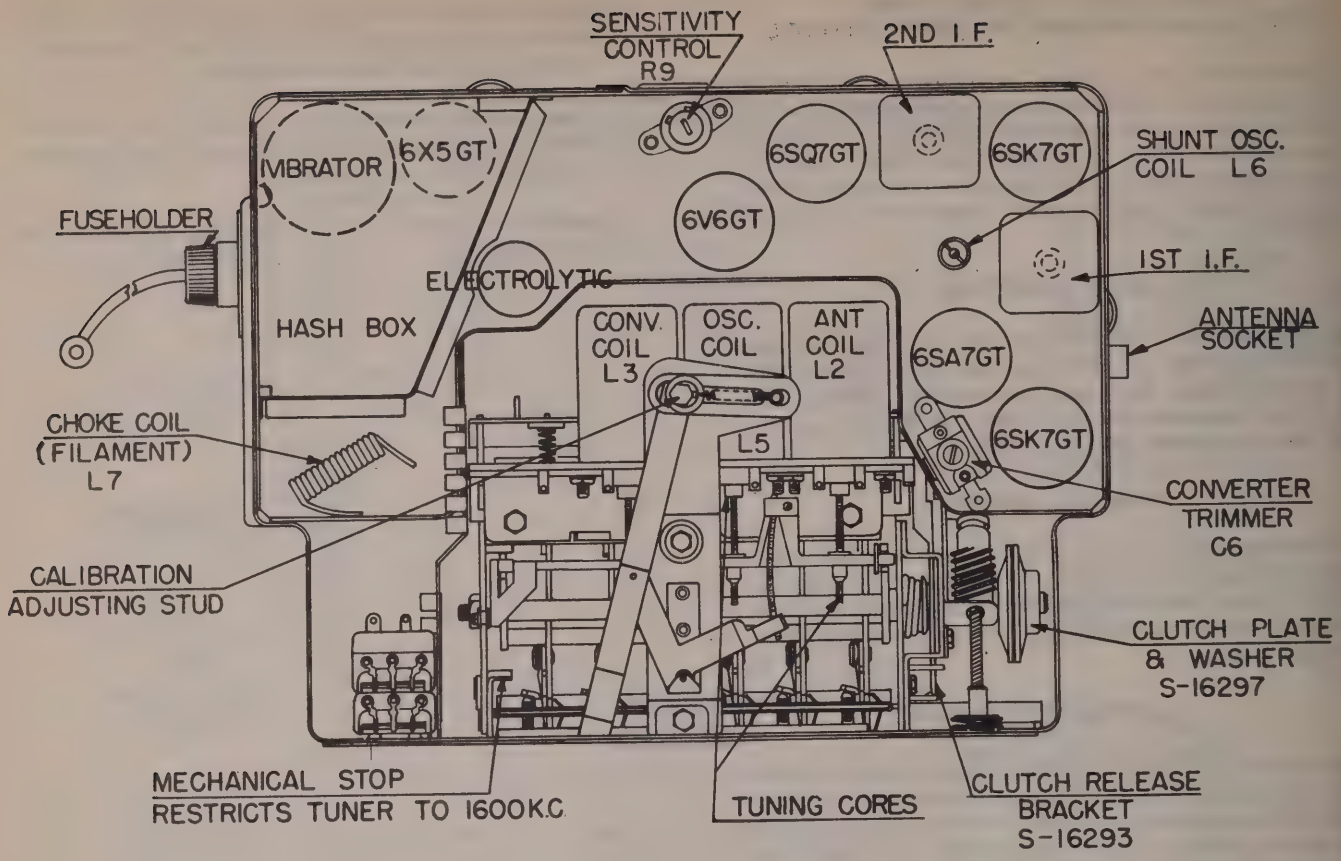

SENSITIVITY CONTROL R9
2ND I.F.
IMBRATOR
6X5GT
6SQ7GT
6SK7GT
SHUNT OSC. COIL L6
FUSEHOLDER
6V6GT
1ST I.F.
ELECTROLYTIC
HASH BOX
CONV. COIL L3
OSC. COIL
ANT COIL L2
ANTENNA SOCKET
6SA7GT
CHOKE COIL (FILAMENT) L7
L5
6SK7GT
CONVERTER TRIMMER C6
CALIBRATION ADJUSTING STUD
CLUTCH PLATE & WASHER S-16297
MECHANICAL STOP RESTRICTS TUNER TO 1600K.C.
TUNING CORES
CLUTCH RELEASE BRACKET S-16293

Fig. 7

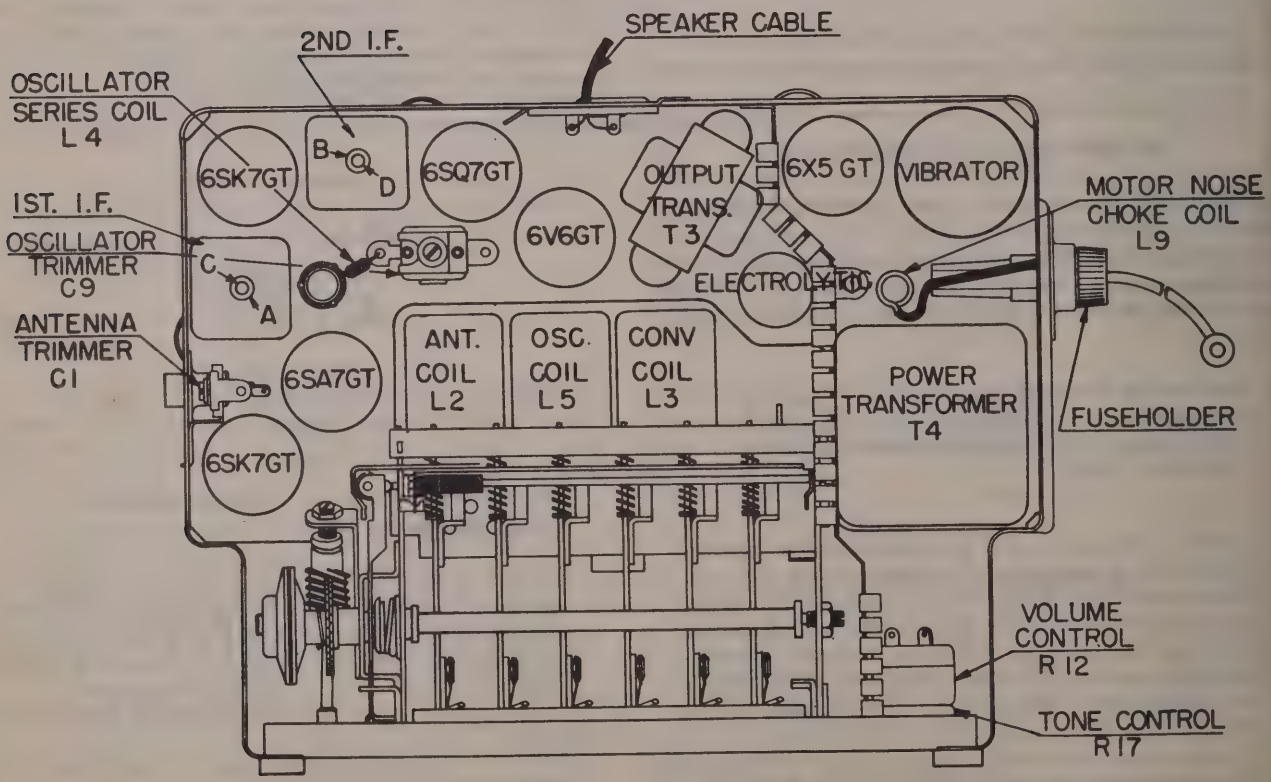

SPEAKER CABLE
2ND I.F.
OSCILLATOR SERIES COIL L4
B
D
6SK7GT
6SQ7GT
OUTPUT TRANS. T3
6X5 GT
VIBRATOR
MOTOR NOISE CHOKE COIL L9
IST. I.F.
OSCILLATOR TRIMMER C9
6V6GT
C
A
ELECTROLYTIC
ANTENNA TRIMMER C1
ANT. COIL L2
OSC. COIL L5
CONV COIL L3
6SA7GT
POWER TRANSFORMER T4
FUSEHOLDER
6SK7GT
VOLUME CONTROL R12
TONE CONTROL R17

Fig. 8

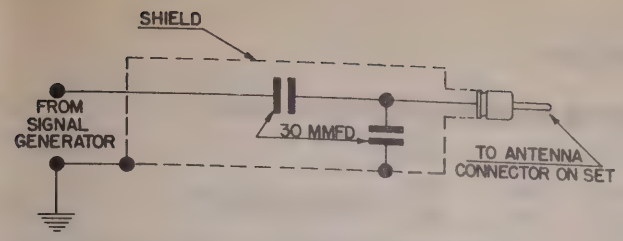


Fig. 9 Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the RF section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

IF ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 6SA7GT converter grid. (Pin No. 8 on socket.)
4. With core alignment tool 68-7 adjust IF cores A, B, C, and D in order named for maximum output. Repeat the operation to insure accurate alignment.

RF AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-9 (Fig. 8) for maximum response.
5. Set signal generator to 1400 Kc.
6. Tune set to 1400 Kc.
7. Adjust converter trimmer C6 (Fig. 7) and antenna trimmer C1 (Fig. 8) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 7)

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

TO REMOVE CORE:

Set tuner cores at "maximum out" position. Using core alignment tool, part number S-13064, screw the core spring down to the support bracket. With your fingers, screw the core spring past the bracket and lift out of the coil.

TO REPLACE CORE:

Place the core in the coil, screw the core spring into and past the support bracket. Use core tuning wrench part number S-13064.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (maximum high frequency end of dial).
4. Screw the cores completely out of the antenna coil, the converter coil, and the oscillator coil.
5. Adjust oscillator trimmer C-9 (Fig. 8) at 1675 Kc.
6. Adjust converter trimmer C6, and antenna trimmer C1 (Figs. 7 and 8) for maximum output reading.
7. Replace cores to their approximate original position.
8. Set signal generator dial and receiver dial to 1400 Kc.
9. Adjust oscillator core L-5 (Fig. 8) to scale at 1400 Kc.
10. Adjust the antenna core L-2, and converter core L-3 (Fig. 7) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-6 (Fig. 7) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a general condenser receiver.
13. Check receiver at 1400 Kc for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop on tuner unit near the volume control should be bent to limit the frequency coverage to 1605 Kc.

SENSITIVITY CONTROL

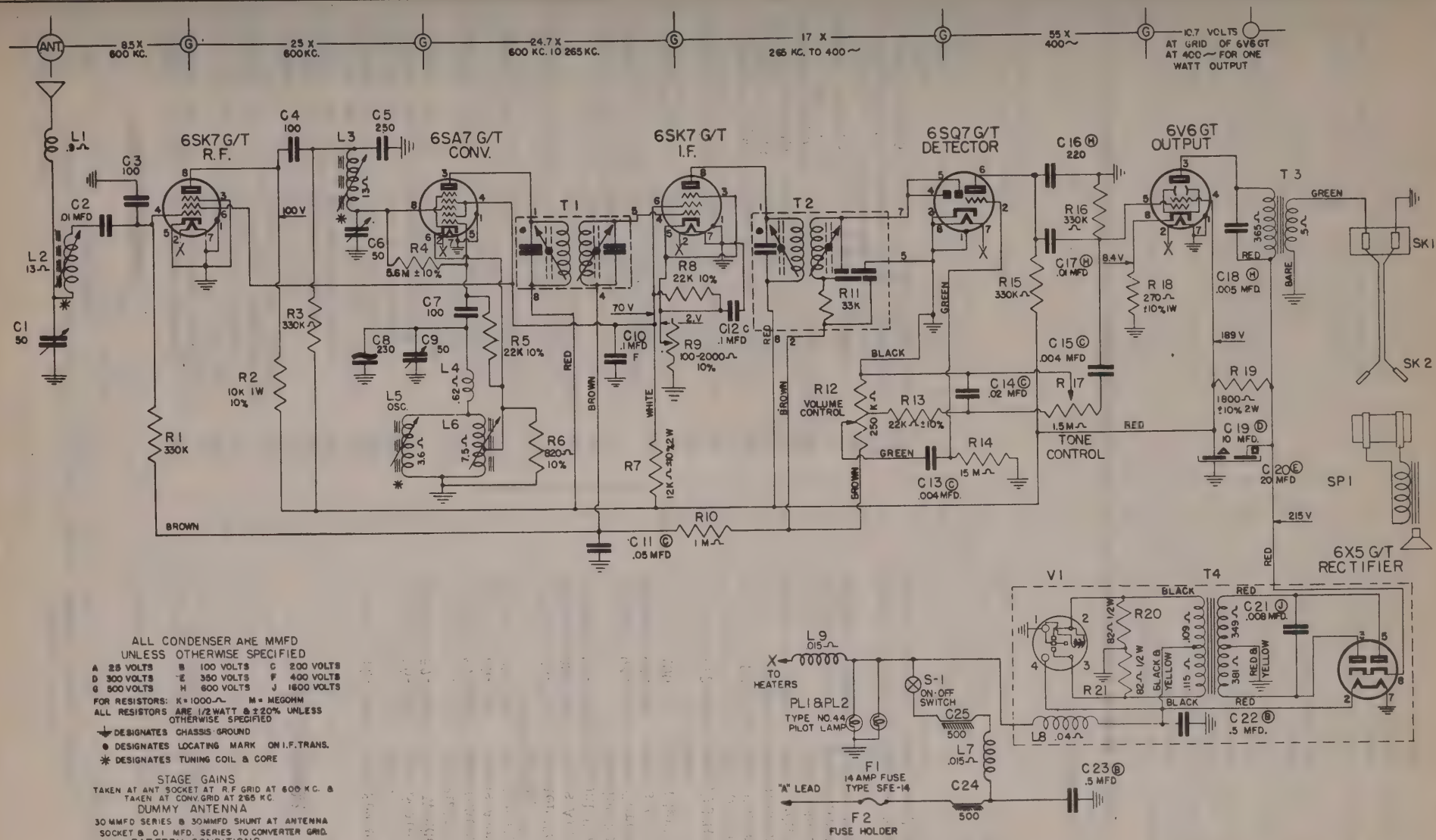
Sensitivity control R9, is factory set and should not be changed. If it is necessary for this control to be readjusted, it should be set to 2 volts DC positive on the cathode of the 6SK7GT IF tube.

MODEL 6H694 HUDSON AUTOMOTIVE RECEIVER, CHASSIS 6G94

Diag. No.	Hudson Part No.	Zenith Part No.	Description	Price
			COILS AND CHOKES	
L8	204890	20-213	Main Hash Choke	.36
L9	223716	20-291	Motor Noise Choke Coil	.20
L7	223717	20-292	Filament Choke Coil	.20
T2	223718	95-1135	2nd IF Transformer	1.85
T1	223719	95-1195	1st IF Transformer	1.60
L1	209741	S8819	Antenna Motor Noise Choke Assy.	.40
L2,L3	215462	S14227	RF Coil Assy.	.90
L5	215461	S14228	Osc. Coil Assy.	.75
L2,L3 L5	223720	S16279	Tuner Unit Coil Assy.	2.75
L4	223721	S16282	Osc. Series Coil Assy	.30
L6	223722	S16283	Osc. Shunt Coil Assy.	.65
			CONDENSERS	
C2,C17	223723	22-3	.01 Mfd. Ceramic (Disc) (or 22-1170) 500 V.	.26
C13,C18	223724	22-4	.004 Mfd. Ceramic (Disc) (or 22-906-838-1180) 500 V	.26
C7	204900	22-162	100 Mmfd. (Molded) 500V	.20
C10	204901	22-170	.1 Mfd. 400V	.26
C16	204902	22-182	220 Mmfd. (Molded) 500V	.26
C12	209577	22-190	.1 Mfd. 200V	.23
C11	204904	22-250	.05 Mfd. 200V	.20
C3	215463	22-365	100 Mmfd.(Molded) 500V	.20
C5	209585	22-1136	250 Mmfd. (Molded)500V	.20
C14	215465	22-1270	.02 Mfd. (Molded) 200V	.20
C19,C20	215466	22-1644	Elec. Cond. 10 Mfd. 300V 20 Mfd. 350V	.45
C22,C23	215471	22-1728	.5 Mfd. 100V	.55
C21	223725	22-1771	.0082 Mfd. (or 22-1448) 1600V	1.00
C1	223728	22-2135	Antenna Trimmer Cond.	.35
C6	223727	22-2136	Converter Trimmer Cond	.40
C9	223728	22-2137	Osc. Trimmer Cond.	.35
C8	223729	22-2151	Compensating Trimmer Cond.	.55
			RESISTORS	
R2		63-1071	10K ohm 1/2W 10% Ins. Res.	.21
R7	223730	63-1091	12K ohm 2W 10% Ins. Res.	.36
R12,S1	215473	63-1587	Vol. & Tone Control Switch	3.01
R19	215474	63-1620	1800 ohm 2W 10% Ins. Res.	.36
R18	215475	63-1621	270 ohm 1W 10% Ins. Res.	.24
R20,R21	215476	63-1740	82 ohm 1/2W 10% Ins. Res.	.21
R5,R8) R13)	215480	63-1841	22K ohm 1/2W 10% Ins. Res.	.21
R1,R15) R16)	215483	63-1891	330K ohm 1/2W 20% Ins. Res.	.21
R10,R17	215484	63-1912	1 Megohm 1/2W 20% Ins. Res.	.21
R4	223733	63-1943	5.6 Megohm 1/2W 10% Ins. Res.	.21
R14	215486	63-1961	15 Megohm 1/2W 20% Ins. Res.	.21
R9	223734	63-2069	Sensitivity Control	.45
R3		63-1891	330,000 ohms 1/2W 20% Ins. Res.	.21
R11		63-1849	33,000 ohms 1/2W 20% (In IF)	.21
			MISCELLANEOUS	
SP1	213880	49-623	P.M. Speaker 6x9	7.75
SK2	223735	52-472	Speaker Cable	.25
	223736	52-544	Battery Cable-Fuse to Set.	.30
	223737	52-546	Two Conductor Cable	.05
	221907	52-559	Battery Cable - Fuse to Ammeter	.30
	223738	57-1596	Capacitor Plate	.04
	223739	57-1597	Ground Plate	.05
	223740	57-1598	Top Ground Plate	.05
	223741	57-1602	Capacitor Plate	.04
	213881	74-49	Speaker Screen	.75
	215493	78-796	Antenna Connector Socket	.20
	215491	78-801	Octal Tube Socket	.15
	215494	78-804	Vibrator Socket	.20
	223742	78-836	Octal Tube Socket	.15
	223743	78-837	Octal Tube Socket	.15
C24,C25	223744	83-1690	Insulation Strip (4 used on spark plate)	.03
	223745	93-456	Vibrator Cushion Washer	.02
T3	223746	95-1029	Output Transformer	2.65
T4	223747	95-1067	Power Transformer	5.25
	171272	125-16	Rubber Grommet	.03
	223748	149-94	Iron Core (3 used)	.35
V1	223749	190-20	Vibrator	4.15
	221936	202-762	Instruction Book (Domestic)	.07
		S14205	Speaker & Screen Assy. (No Hudson Part No.)	9.25
			INSTALLATION AND SUPPRESSION KIT	
	221938	S16266	Installation & Supp. Kit Assy. (Complete)	3.20
	208592	22-1537	Generator & Ignition Coil Cond. (2 used)	.77
	213896	46-698	Trim Knob	.35
	213895	46-699	Tone Control Knob	.35
		52-559	Battery Cable-Fuse to Ammeter.	.30
	221906	63-1046	Distributor Suppressor	.31
	213894	80-594	Knob Tension Spring	.01
F2	170480	136-18	14 amp. Fuse - Type SFE-14.	.25

Diag. No.	Hudson Part No.	Zenith Part No.	Description	Price
			TUNER ASSEMBLY	
	223750	17-102	Cam Lock (6 used)	.03
	223751	56-279	Release Bar Retaining Pin	.05
	223752	57-1570	Front Guide Plate	.20
	223753	73-115	#8-32x3/8" Slab Hd. Set Screw Cup Pt. (2 used)	.03
	223754	76-566	Drive Shaft	.35
	223756	80-755	Plunger Spring	.02
	223757	80-757	Release Bar Spring	.09
	223758	80-759	Clutch Release Spring	.02
	223759	80-762	Anti-Rattle Spring	.01
	223760	80-777	Cam Lock Spring	.03
	223761	80-783	Gear Tension Spring	.06
	223762	93-921	Tuning Shaft Washer (used on S-16295)	.02
	223763	93-922	Spring Washer (used on S-16295)	.02
	223764	93-923	Fishpaper Washer (used on S-16295)	.01
	223765	93-1024	Worm Gear Tension Washer (used on S-16295)	.02
		93-1041	Shim Washer	.02
	223766	112-759	Rivet Screw	.04
	223767	112-785	Worm Retaining Screw (used on S-16294)	.04
	223768	184-14	Steel Ball - 1/8" Dia. (11 used)	.01
	223769	188-111	Retaining Ring (used on S-16295)	.02
	223770	S16285	Gear & Bushing Assy.	.65
	223771	S16289	Treadle Assy.	1.00
	223772	S16291	Plunger & Cam Assy.	.75
	223775	S16292	Release Bar & Cam Assy	.20
	223774	S16293	Clutch Release Brkt & Roller Assy.	.25
	223775	S16294	Worm Gear & Brkt Assy	.75
	223776	S16295	Front Plate & Shaft Assy	2.00
	223777	S16296	Plunger Screw & Knob Assy.	.70
	223778	S16297	Clutch Plate & Washer	.65
	223755	S16251	Tuner Unit Assy.	13.50
			DIAL ASSEMBLY	
	223701	12-1705	Dial Scale Retaining Brkt.	.20
	223700	26-428	Dial Scale	.90
	215445	57-1341	Esc. Window Retaining Plate	.30
	223702	57-1595	Escutcheon	1.30
	223703	80-710	Cross Arm Spring	.08
	223704	80-770	Pointer Pivot Tension Spring	.03
	223705	80-778	Pointer Tension Spring	.10
	223706	80-779	Cross Arm Tension Sprg	.08
	223707	93-1029	Special Washer (Pointer Tension Spring)	.01
	223708	94-613	Iron Core Insul. Bush.	.06
	223709	94-694	Cross Arm Insul.Bush.	.08
PL1,PL2	171113	100-36	Dial Light Bulb (Mazda #44)	.09
	171251	112-684	#4x3/16 B.H.S.T.Screw Cad. (2 used on 57-1341)	.01
	215444	192-118	Esc. Window	.20
	223710	S16250	Escutcheon Assy.	2.80
	223711	S16268	Dial Light Socket & Wire Assy.	.85
	223712	S16269	Cross Arm & Bush.Assy	1.35
	223713	S16270	Pointer Drag Link & Stud Assy.	.30
	223714	S16272	Pointer Support Brkt.Assy	.20
	223715	S16271	Pointer & Bracket Assy.	.25

All prices shown are suggested list prices and subject to change without notice.



ALL CONDENSER ARE MMFD
UNLESS OTHERWISE SPECIFIED

A	25 VOLTS	B	100 VOLTS	C	200 VOLTS
D	300 VOLTS	E	350 VOLTS	F	400 VOLTS
G	500 VOLTS	H	600 VOLTS	J	1600 VOLTS

FOR RESISTORS: K = 1000Ω M = MEGOHM
ALL RESISTORS ARE 1/2 WATT & ±20% UNLESS OTHERWISE SPECIFIED

⏚ DESIGNATES CHASSIS GROUND
● DESIGNATES LOCATING MARK ON I.F. TRANS.
✱ DESIGNATES TUNING COIL & CORE

STAGE GAINS

TAKEN AT ANT SOCKET AT R.F GRID AT 600 KC. & TAKEN AT CONV. GRID AT 265 KC.

DUMMY ANTENNA

30 MMFD SERIES & 30 MMFD SHUNT AT ANTENNA SOCKET & .01 MFD. SERIES TO CONVERTER GRID.

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL

VOLTAGES TO READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER
ALL TUBE SOCKETS ARE BOTTOM VIEWS

SCHEMATIC DIAGRAM FOR 6 TUBE HUDSON GH-694

I.F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.

ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS
U.S.A.

SERVICE MANUAL

Model GN695
(Nash Part No.
A.C.-150-1)

Model GN596
(Nash Part No.
A.C.-150-2)

ZENITH
LONG DISTANCE AUTO RADIO

ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

NASH MODEL GN695

Tuning Range.....540-1600KC

Intermediate Frequency.....265KC

Power Output.....4.5 Watts measured at the Voice Coil

Sensitivity.....4 Microvolts at one watt output

Current Consumption.....6.0 Amperes

(During Change Cycle).....20.0 Amperes

Tube Compelment.....7A7 R.F.

7B8 Converter, 7A7 I.F., 7B6 Detector and 1st audio, 7C5 power output, 7Y4 rectifier

Speakers.....Front (6″ round)
Rear (6″ x 9″ oval)

Tone Control.....Continuously variable

Automatic Push-Button Tuning

Automatic Foot Switch Station

Selector Control

NASH MODEL GN596

Tuning Range.....540-1600KC

Intermediate Frequency.....265KC

Power Output.....4.5 Watts measured at the Voice Coil

Sensitivity.....8 Microvolts at one watt output

Current Consumption.....5.5 Amperes

Tube Complement.....6BE6 Converter

7A7 I.F., 7B6 detector and 1st audio, 7C5 power output, 7Y4 rectifier

Speaker.....Front 6″ round
6″ x 9″ Oval Rear Speaker (optional)

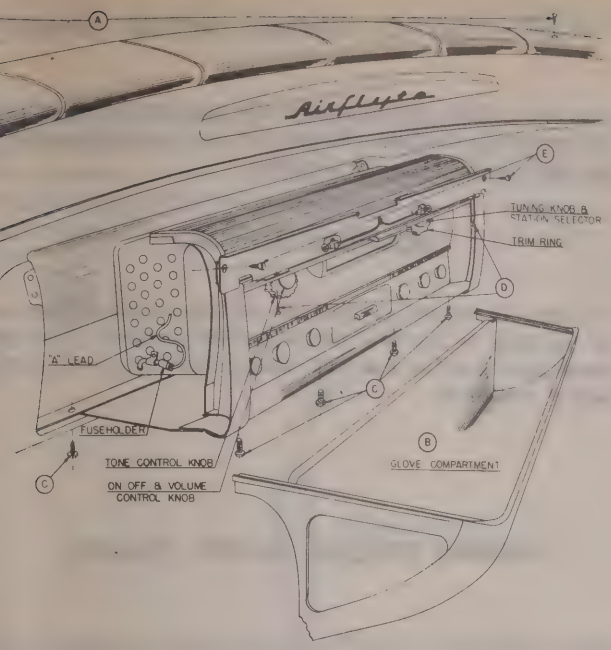


Fig. 1

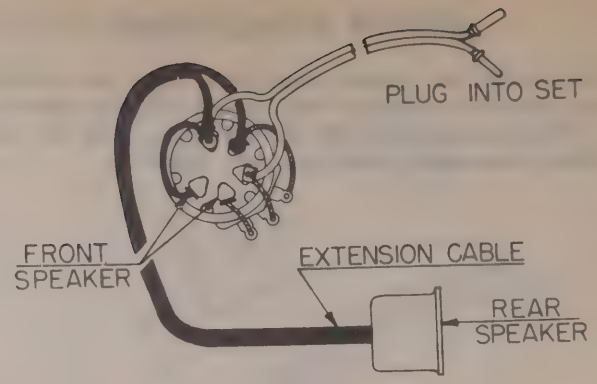
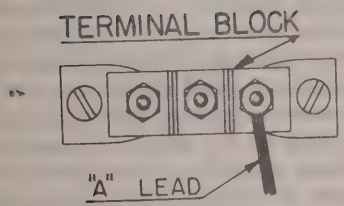


Fig. 1A



"A" LEAD CONNECTION

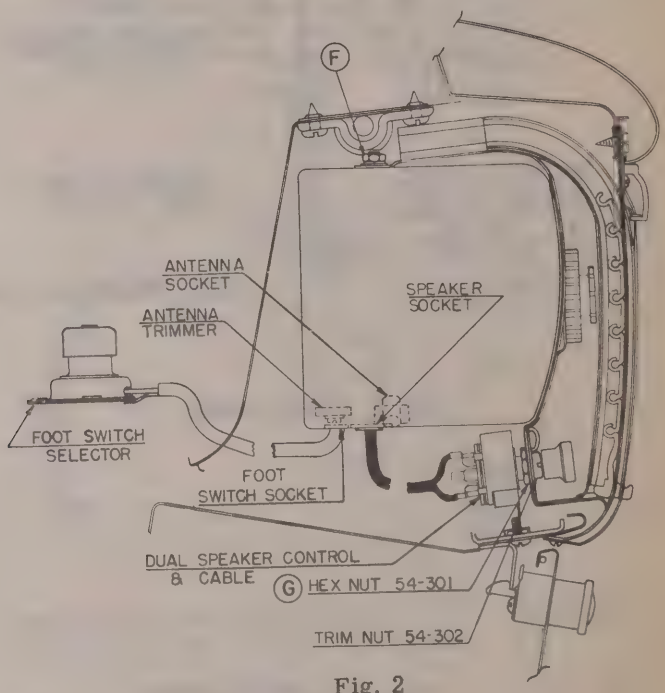


Fig. 2

RECEIVER INSTALLATION

Figures 1, 1A and 2, illustrating the installed receiver, rear speaker volume control assembly, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary.

To take receiver from car:

1. Remove crash pad (4 screws). (See "A" Fig. 1).
2. Remove glove compartment (See "B" Fig. 1).
3. Remove 8 bolts (See "C" - Fig. 1).
4. Remove 2 screws to release medallion. (See "D" Fig. 1.)
5. Remove 2 screws to release radio and accessory compartment. (See "E" Fig. 1).
6. Pull entire compartment just far enough to disconnect accessory wires.
7. Disconnect front speaker cable from socket of dual speaker control and speaker cable from set. Disconnect "A" lead, antenna cable and foot control switch cable from set. (Figs. 1, 1A and 2.)
8. After all wires have been disconnected, remove the compartment.
9. Remove dual speaker control.
10. Remove the receiver from the compartment by removing nuts and lockwashers on both rear set mounting studs (See F - Fig. 2) Take off knobs on set with Allen wrench. Remove front plain washer, and threaded trim ring on tuning control side and washer and hex-nut on volume control side or threaded trim ring on volume control side.

To install receiver, reverse preceding steps for removal.

SPEAKER INSTALLATIONS

To take out front speaker, remove the right side kick pad, and remove the four lock washers #93-126, four nuts #54-30, four screws #112-739, and trim ring #188-115, that holds the speaker to the kick pad. Figure 3.

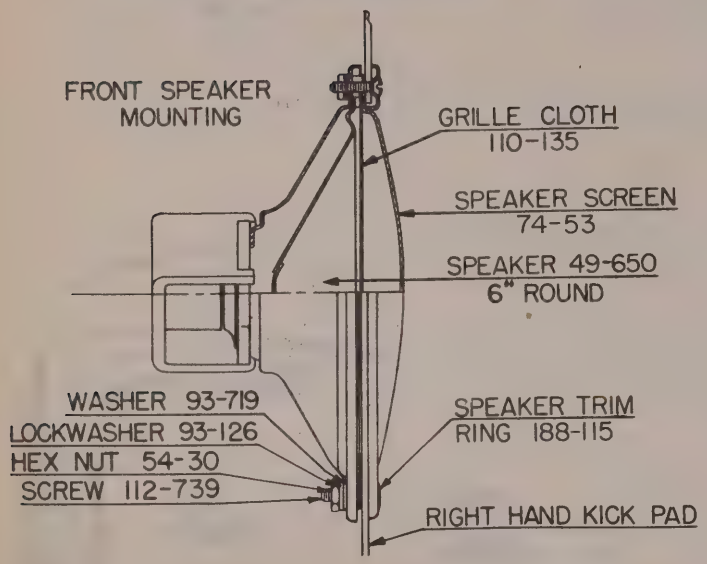


Fig. 3 Front Speaker.

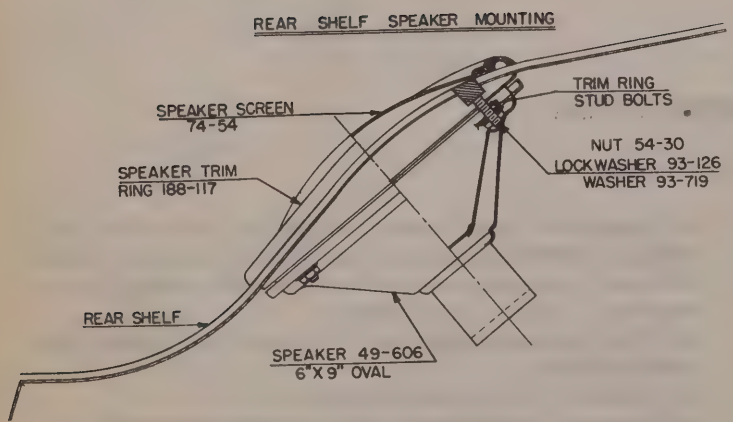


Fig. 4 Rear Speaker.

To take out the rear speaker, remove the four flat washers #93-719, four lock-washers #93-126, and four hex-nuts #54-30, that holds the speaker to the underside of the rear shelf. Figure 4.

FOOT CONTROL SWITCH (MODEL GN695)

The foot control switch allows the automatic selection o stations with the foot. Press the foot control button a the way down to change stations.

MANUAL TUNING

To tune set manually, push the station selector knob u til the hole on the dial scale is illuminated. It is on necessary for the manual tuning knob to be turned select stations.

MUTING CIRCUIT (MODEL GN695)

Lightly pressing either the station selector knob or th foot control switch mutes the receiver. This action accomplished by shorting out the speaker voice coi

SETTING THE AUTOMATIC TUNER

The five automatic positions may be adjusted to any de sired dial settings, however, in order to simplify th identification of the stations, it is advisable to set th tuner in sequence according to the frequencies of th broadcasting stations beginning with the station broad casting at the lowest frequency and progressing to th station broadcasting at the highest frequency.
The automatic tuner should be set up during the daytim because sometimes at night distant stations will be hea with the same volume as local stations, making it di ficult to identify the local stations.
To set the tuner proceed as follows:

1. Turn the receiver on and allow it to operate fo at least fifteen minutes in order for each part to rea normal operating temperature.
2. Collapse the antenna.

3. Press the tuning control knob repeatedly until the ho in the dial scale background is illuminated. Press t tuning control knob once more to move the tuning mec anism to the number 1 automatic position.
4. Pull the tuning control knob outward and, at the sa time, turn the knob to tune in the station desired on No position. Tune very carefully for clearest receptio The first position is now set to receive the desired st tion.

5. Follow the above procedure for each of the other fo automatic positions.
When the five automatic positions have been set to t five favorite stations, extend the antenna and check t antenna trimmer adjustment (See Installation Instru tions).

ıere should be no motor noise or interference from the nition circuit if the receiver has been installed in the r according to the instructions furnished with it. The terference suppression equipment may be checked for oper installation by referring to the following illustra- ons:

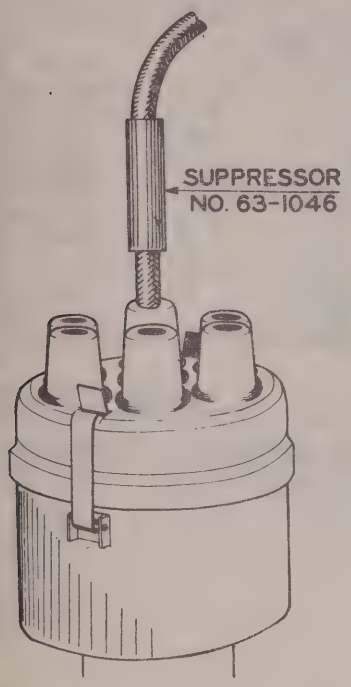


Fig. 5

REMOVE CLIP, AND
INSTALL GROUNDING STRIP
AS ILLUSTRATED USING SCREW #12-746
BEND GROUNDING STRIP 80-145 OVER
AS SHOWN AFTER TIGHTENING SCREW

Fig. 7

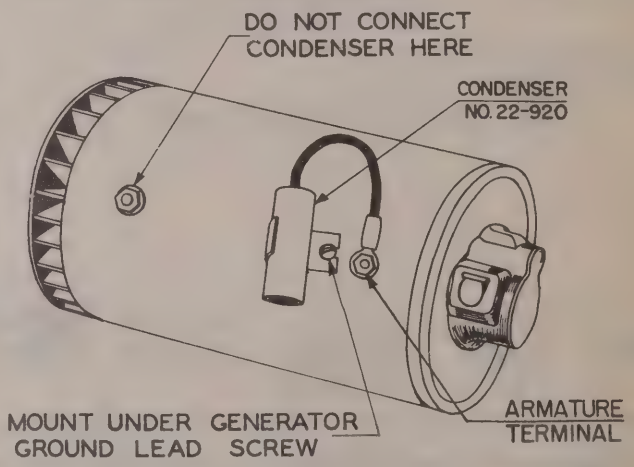


Fig. 8

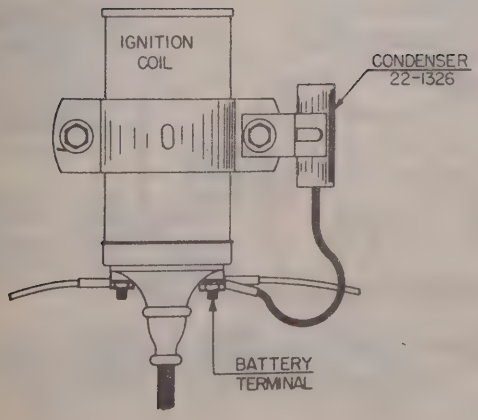


Fig. 6

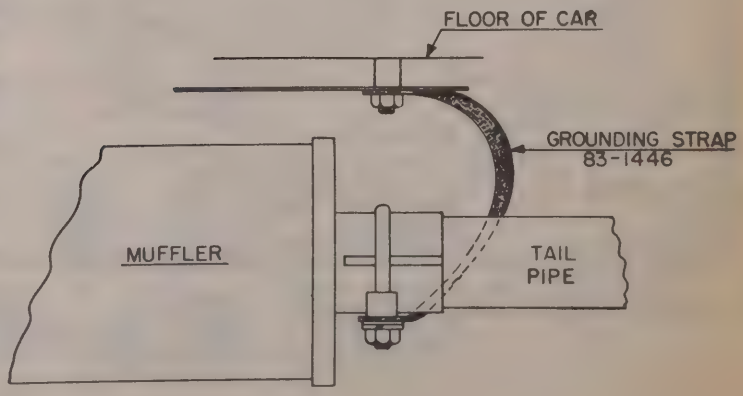


Fig. 9

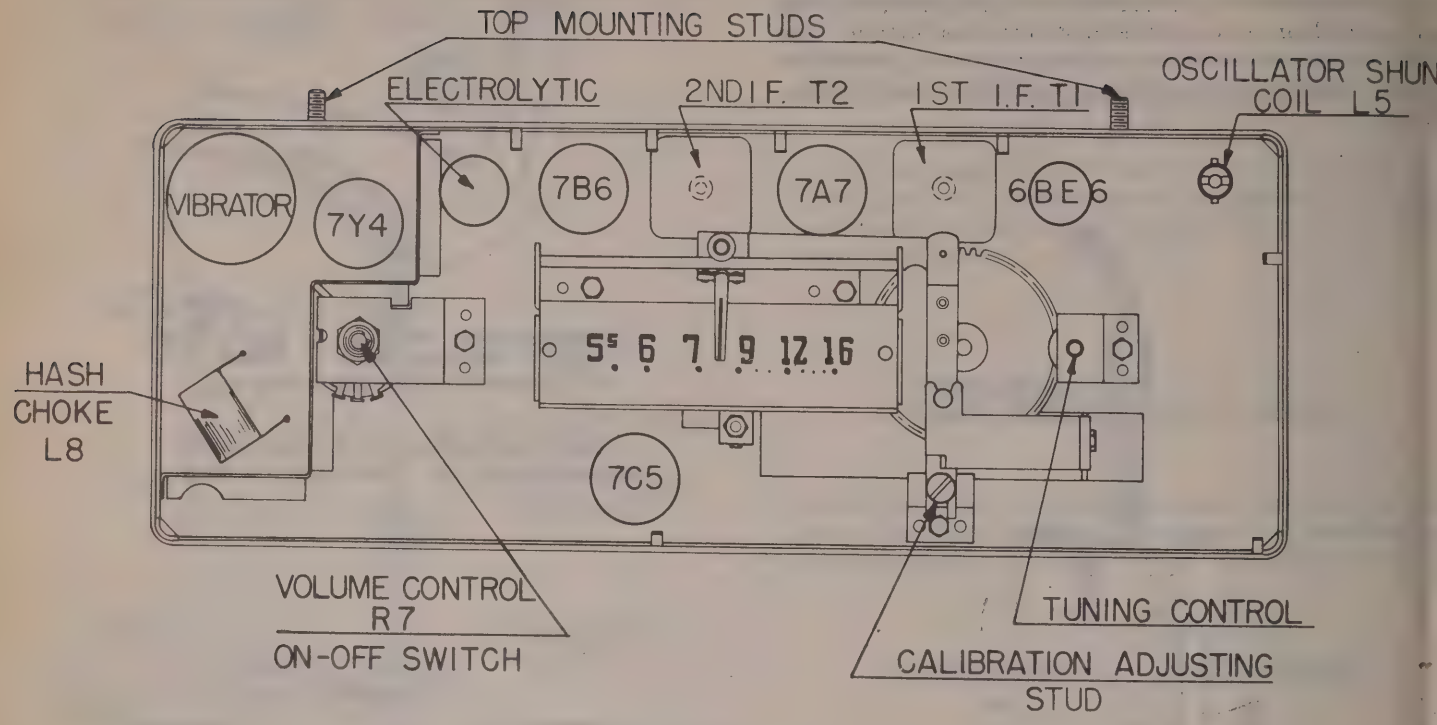

TOP MOUNTING STUDS
ELECTROLYTIC
2ND I.F. T2
1ST I.F. T1
OSCILLATOR SHUN
COIL L5
VIBRATOR
7Y4
7B6
7A7
6BE6
HASH
CHOKE
L8
5 6 7 9 12 16
7C5
VOLUME CONTROL
R7
ON-OFF SWITCH
TUNING CONTROL
CALIBRATION ADJUSTING
STUD

Fig. 10

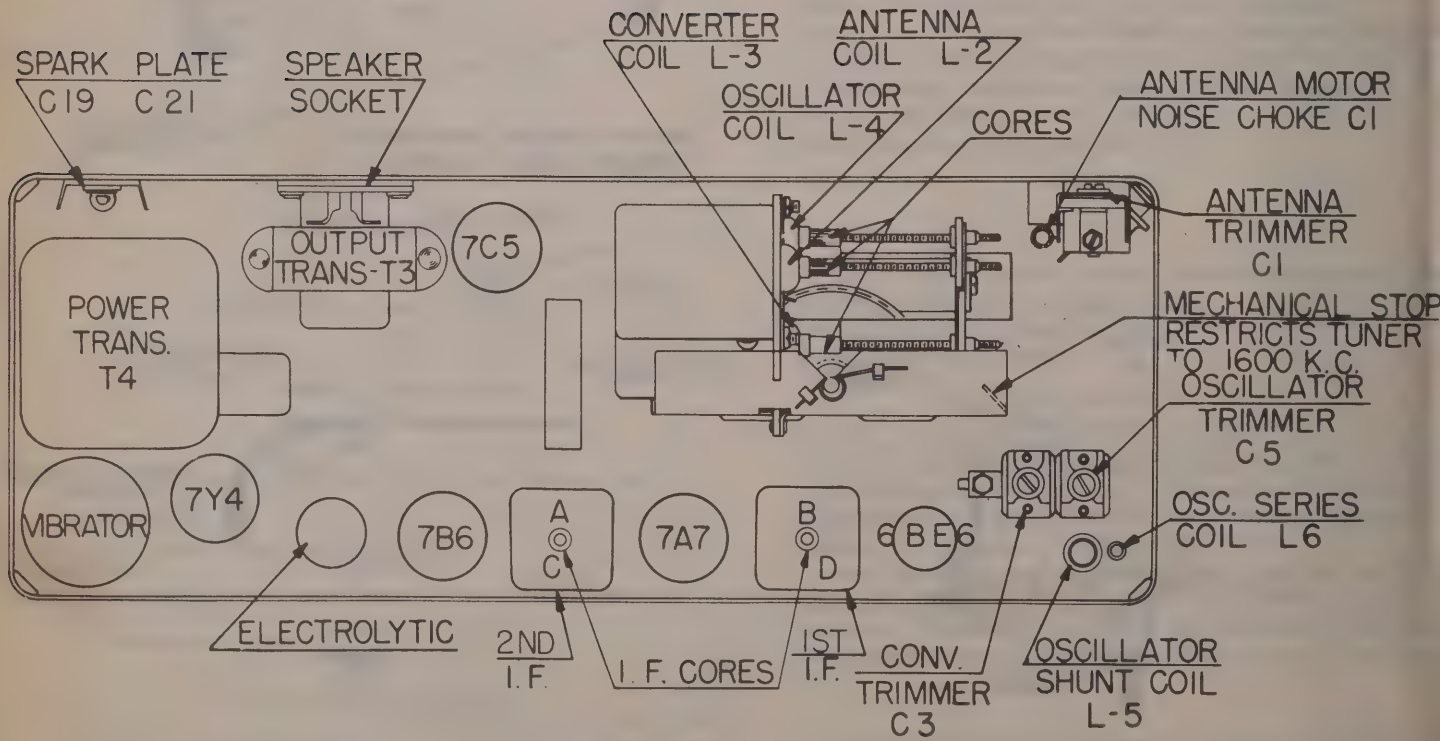

SPARK PLATE
C19 C21
SPEAKER
SOCKET
CONVERTER
COIL L-3
ANTENNA
COIL L-2
OSCILLATOR
COIL L-4
CORES
ANTENNA MOTOR
NOISE CHOKE C1
ANTENNA
TRIMMER
C1
OUTPUT
TRANS-T3
7C5
POWER
TRANS.
T4
MECHANICAL STOP
RESTRICTS TUNER
TO 1600 K.C.
OSCILLATOR
TRIMMER
C5
VIBRATOR
7Y4
7B6
A
C
7A7
B
D
6BE6
OSC. SERIES
COIL L6
ELECTROLYTIC
2ND
I.F.
I.F. CORES
1ST
I.F.
CONV.
TRIMMER
C3
OSCILLATOR
SHUNT COIL
L-5

Fig. 11

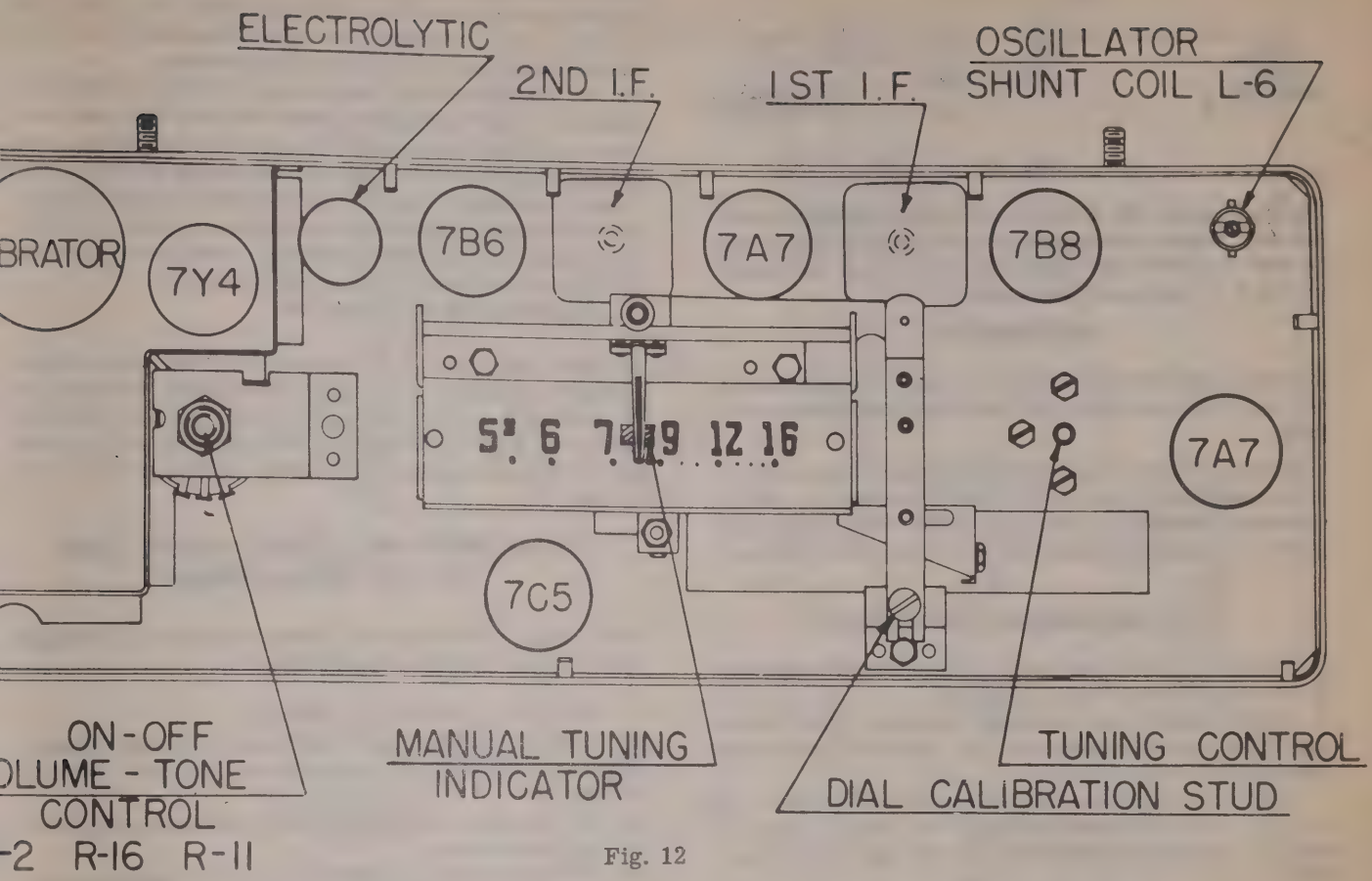

ELECTROLYTIC
2ND I.F.
1ST I.F.
OSCILLATOR
SHUNT COIL L-6
BRATOR
7Y4
7B6
7A7
7B8
7A7
7C5
ON-OFF
OLUME - TONE
CONTROL
-2 R-16 R-11
MANUAL TUNING
INDICATOR
TUNING CONTROL
DIAL CALIBRATION STUD

Fig. 12

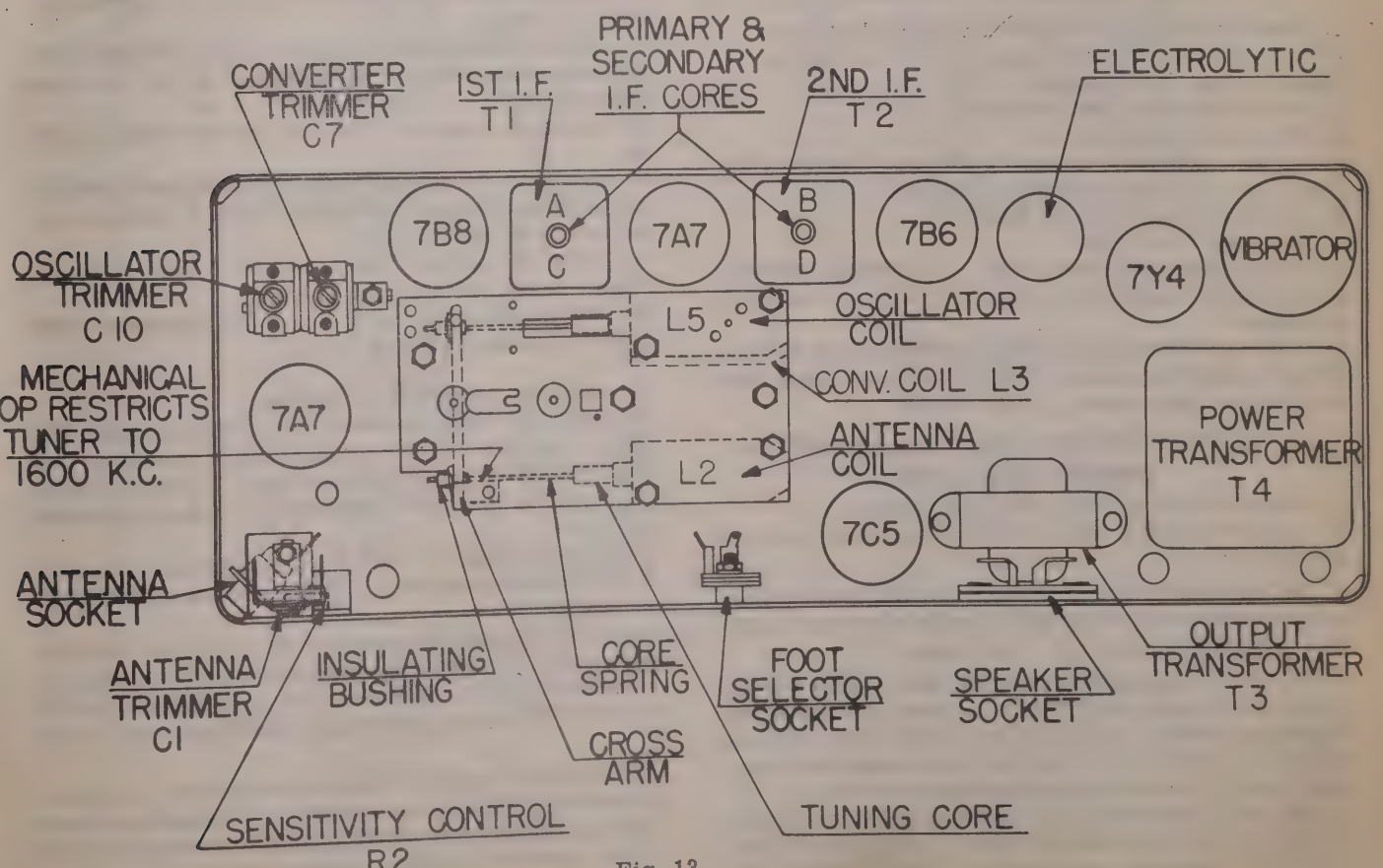

CONVERTER
TRIMMER
C7
1ST I.F.
T1
PRIMARY &
SECONDARY
I.F. CORES
2ND I.F.
T2
ELECTROLYTIC
7B8
A
C
7A7
B
D
7B6
7Y4
VIBRATOR
OSCILLATOR
TRIMMER
C 10
L5
OSCILLATOR
COIL
CONV. COIL L3
MECHANICAL
OP RESTRICTS
TUNER TO
1600 K.C.
7A7
ANTENNA
COIL
L2
POWER
TRANSFORMER
T4
7C5
ANTENNA
SOCKET
ANTENNA
TRIMMER
C1
INSULATING
BUSHING
CORE
SPRING
FOOT
SELECTOR
SOCKET
SPEAKER
SOCKET
OUTPUT
TRANSFORMER
T3
CROSS
ARM
SENSITIVITY CONTROL
R2
TUNING CORE

Fig. 13

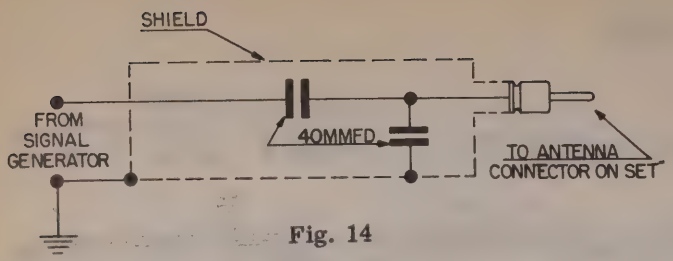


Fig. 14

Figure 14 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver, therefore, follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I. F. ALIGNMENT PROCEDURE

1. Remove front and rear covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd dummy to 7B8 or 6BE6 converter grid. (Pin No. 6 on socket) (Model GN596 Pin No. 7).
4. With core alignment tool 68-7 adjust I.F. cores, A,B, C, and D in order named for maximum output. (Figs. 11 and 13) Repeat the operation to assure accurate alignment.

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 14, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 600 Kc.
3. Tune set to 600 Kc.
4. Adjust oscillator trimmer C-10 (C-5 - Model GN596) (Figs. 11 - 13), for maximum response.
5. Set signal generator to 1400 Kc.
6. Tune set to 1400 Kc.
7. Adjust converter trimmer C-7, (C-3 Model GN596) , and antenna trimmer C-1 (Figs. 11-13) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric stud at fulcrum of dial pointer. (Figs. 10-12).

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

1. Remove the top cover from the receiver.
2. Remove 7A7 R.F. tube, 7B8 converter tube, and 7A7 I.F. tube.
3. Put automatic tuner in manual position and turn the tuner carriage all the way out to the high frequency position or with the cores out of the coils.
4. With core alignment tool, No. S-13064, screw the antenna core back all the way, at the same time using the fingers to guide it out of the automatic unit. With the fingers, remove core by turning core spring back past and through the cross arm insulating bushing.
5. Screw the converter and oscillator cores completely out of the coils. Set tuner carriage to half way position. Screw the converter and oscillator cores back all the way, at the same time using the fingers to guide them between the I.F. cans and out of the tuner unit. With the fingers, remove the cores by turning them past and through the cross arm insulating bushing.
6. To replace cores, turn tuner carriage to half way position. With the fingers, guide the oscillator and converter cores between the I.F. coils and screw the core springs through the cross arm insulating bushing. Set tuner carriage to high frequency position and also using the fingers, screw the antenna core spring through the cross arm insulating bushing. Use core alignment tool No. S-13064 for further adjustments.
7. Replace tubes and top cover.

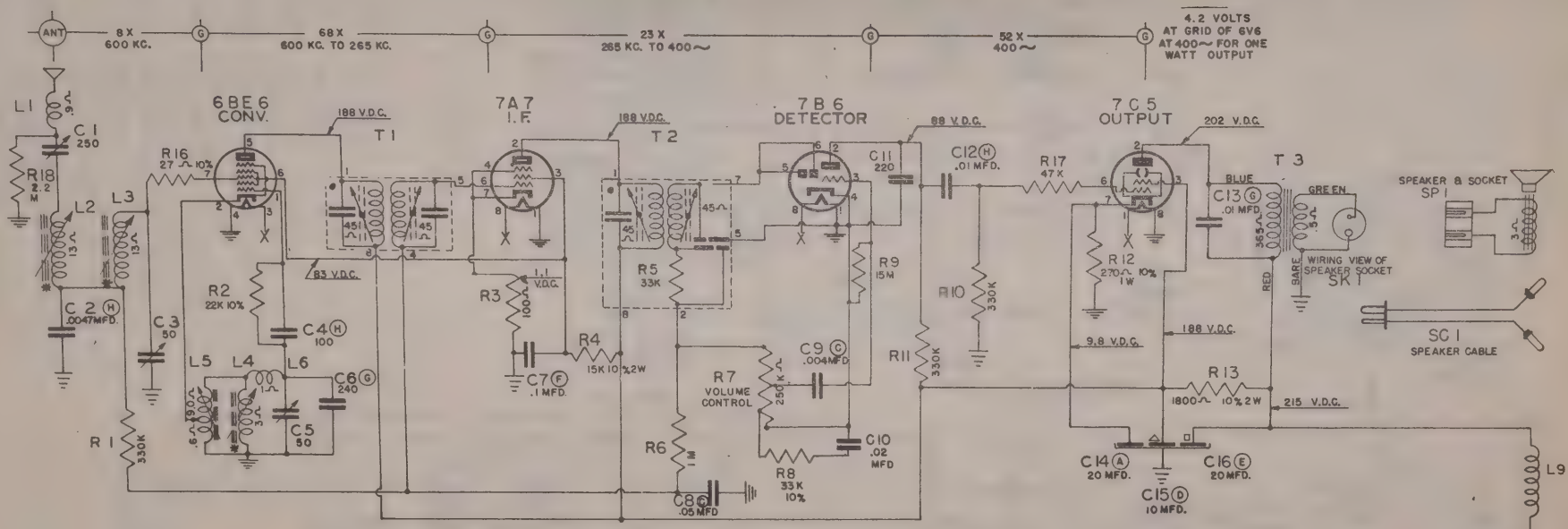
On Nash Model GN596 it is unnecessary to remove tubes for core removal. Turn tuner carriage all the way out to the high frequency position or with cores out of coils. Use core alignment tool S-13064 and fingers to guide cores through cross arm insulating bushing and back out of unit.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 14 to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial).
4. Screw the cores completely out of the antenna coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (C-5 Model GN-596) at 1675 Kc.
6. Adjust the converter trimmer C-7, (C-3 Model GN-596) and antenna trimmer C-1 (Figs. 11-13 for maximum output reading.
7. Set signal generator dial and receiver dial to 1400 Kc.
8. Replace cores to their approximate original position (so that the cores project about 11/16 of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (L-4 Model GN-596) (Figs. 11-13), scale at 1400 Kc.
10. Adjust the antenna core L-2, and converter core L-3 for maximum output reading.
11. Set signal generator at 600 Kc.
12. "Rock in" shunt oscillator coil L-6 (L-5 Model GN-596), (Figs. 10-12) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1400 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop should be bent to limit the frequency coverage to 1605 Kc. (Figs. 11-13).

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1400 Kc.



ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED

A = 25 VOLTS B = 100 VOLTS C = 200 VOLTS D = 300 VOLTS
E = 350 VOLTS F = 400 VOLTS G = 500 VOLTS H = 600 VOLTS
J = 1600 VOLTS

● DESIGNATES LOCATING MARK ON I.F. TRANS.

✳ DESIGNATES TUNING COIL & CORE.

⏚ DESIGNATES CHASSIS GROUND

FOR RESISTORS: K = 1000 Ω M = MEGOHM

ALL RESISTORS ARE 1/2 WATT & ±20% UNLESS OTHERWISE SPECIFIED

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANTENNA SOCKET AT R.F. GRID AT 600 KC AND TAKEN AT CONV. GRID AT 265 K.C.

DUMMY ANTENNA

40 MMFD. SERIES & 40 MMFD. SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONV. GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOLUME CONTROL SET AT MAXIMUM. VOLTAGES TO READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER.

SCHEMATIC DIAGRAM FOR 5 TUBE

NASH GN596

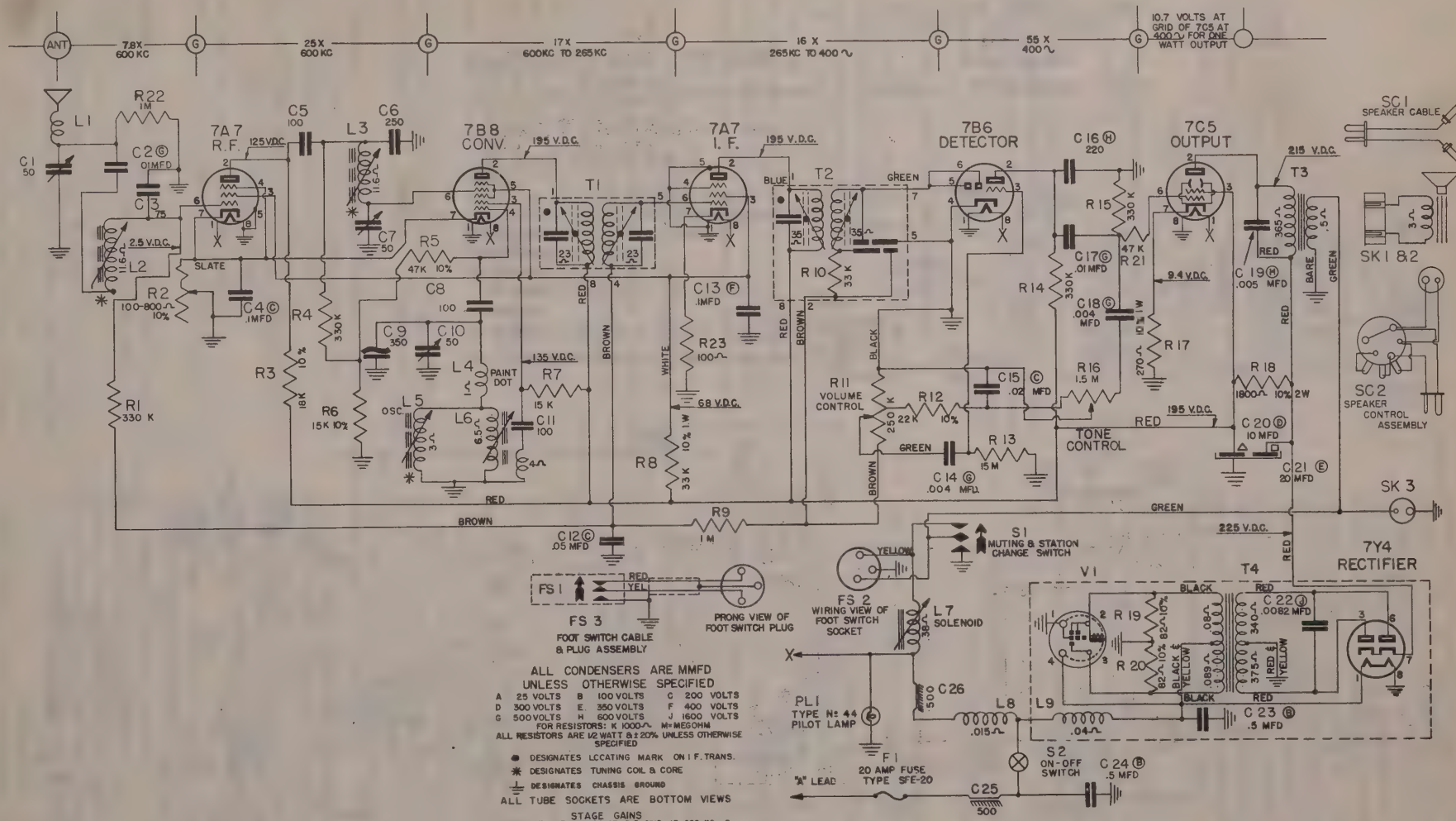
I. F. 265 KC.

TUNING RANGE 540 KC. TO 1600 KC.

ZENITH RADIO CORPORATION

CHICAGO 39, ILLINOIS

U. S. A.


ANT
7.8X 600 KC
25X 600 KC
17X 600KC TO 265KC
16 X 265KC TO 400
55 X 400
10.7 VOLTS AT GRID OF 7C5 AT 400 FOR ONE WATT OUTPUT
7A7 R.F.
7B8 CONV.
7A7 I. F.
7B6 DETECTOR
7C5 OUTPUT
7Y4 RECTIFIER
SC1 SPEAKER CABLE
SK1 &2
SC2 SPEAKER CONTROL ASSEMBLY
SK 3
VOLUME CONTROL
TONE CONTROL
MUTING & STATION CHANGE SWITCH
FS 1
FS 2 WIRING VIEW OF FOOT SWITCH SOCKET
FS 3 FOOT SWITCH CABLE & PLUG ASSEMBLY
PRONG VIEW OF FOOT SWITCH PLUG
L7 SOLENOID
PL1 TYPE No 44 PILOT LAMP
F1 20 AMP FUSE TYPE SFE-20
S2 ON-OFF SWITCH
"A" LEAD
SLATE
PAINT DOT
OSC.
2.5 V.D.C.
125 V.D.C.
195 V.D.C.
135 V.D.C.
68 V.D.C.
9.4 V.D.C.
215 V.D.C.
225 V.D.C.
ALL CONDENSERS ARE MMFD UNLESS OTHERWISE SPECIFIED
A 25 VOLTS B 100 VOLTS C 200 VOLTS
D 300 VOLTS E 350 VOLTS F 400 VOLTS
G 500 VOLTS H 600 VOLTS J 1600 VOLTS
FOR RESISTORS: K 1000 M=MEGOHM
ALL RESISTORS ARE 1/2 WATT & ± 20% UNLESS OTHERWISE SPECIFIED
DESIGNATES LOCATING MARK ON I.F. TRANS.
DESIGNATES TUNING COIL & CORE
DESIGNATES CHASSIS GROUND
ALL TUBE SOCKETS ARE BOTTOM VIEWS
STAGE GAINS
TAKEN AT ANT. SOCKET AT R.F. GRID AT 600 KC & TAKEN AT CONV. GRID AT 265 KC.
DUMMY ANTENNA
40 MMFD. SERIES & 40 MMFD. SHUNT AT ANTENNA SOCKET & 0.1 MFD SERIES TO CONVERTER GRID.
BATTERY CONDITIONS
6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED
TEST CONDITIONS
VOLUME CONTROL SET AT MAXIMUM TONE CONTROL SET ON "HIGH" WITH NO INCOMING SIGNAL.
VOLTAGES TO READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHMS PER VOLT METER

SCHEMATIC DIAGRAM FOR 6 TUBE

NASH GN695
WITH FOOT CONTROL
I.F. 265 KC.
TUNING RANGE 540KC. TO 1600 KC.
ZENITH RADIO CORPORATION
U. S. A.

PARTS LIST MODEL GN695 NASH PART NO. A.C. 150-1

DIAG. NO.	PART NO.	DESCRIPTION	PRICE
		COILS & CHOKES	
L9	20-213	Main Hash Choke Coil	.36
T1	95-1192	1st I.F. Transformer	1.60
T2	95-1193	2nd I.F. Transformer	1.70
L1	S-8819	Antenna Motor Noise Choke Assy.	.40
L8	S-13999	Motor Noise Choke Coil Assy.	.35
L4	S-16127	Osc. Series Coil Assy.	.40
L6	S-16128	Osc. Shunt Coil Assy.	.90
		CONDENSERS	
C2,C17	22-3	.01 Mfd. Ceramic (Disc) (or 22-1170) 500 V	.26
C14,C18	22-4	.004 Mfd. Ceramic (Disc) (or 22-906) 500 V	.26
C5,C8,) C11)	22-162	100 Mmfd. (Molded) 500V	.20
C13	22-170	.1 Mfd. (or 22-1748) 400 V	.26
C16	22-182	220 Mmfd. (Molded) 500 V	.26
C4	22-190	.1 Mfd. (or 22-1777) 200 V	.23
C12	22-250	.05 Mfd. (or 22-1778 200 V	.20
C19	22-838	.005 Mfd. (or 22-1782) 600 V	.20
C6	22-1136	250 Mmfd. (Molded) 500 V	.20
C3	22-1256	75 Mmfd. (Molded) 500 V	.20
C15	22-1270	.02 Mmfd. (or 22-1781) 200 V	.20
C9	22-1478	350 Mmfd. Compensating Condenser.	.53
C21	22-1644	Elect. Condenser 10 Mfd. 300 V, 20 Mfd. 350 V	1.60
C7, C10	22-1680	Two Section Trimmer (Osc. & Converter)	.60
C1	22-1704	Antenna Trimmer Condenser	.35
C23,C24	22-1728	.5 Mfd. 100 V	.55
C22	22-1771	.008 Mfd. (or 22-1448) 1600 V	1.00
C25,C26	27-87	500 MMf Spark Plate	
		RESISTORS	
R2	63-1267	Sensitivity Control	.56
R8	63-1398	33K ohm 1 W 10% Ins. Resistor	.24
R18	63-1620	1800 ohm 2W 10% Ins. Resistor	.36
R17	63-1621	270 ohm 1 W 10% Ins. Resistor	.24
R19,R20	63-1740	82 Ohm 1/2 W. 10% Ins. Resistor	.21
R23	63-1744	100 ohm 1/2 W 20% Ins. Resistor	.21
R6	63-1834	15K ohm 1/2 W 10% Ins. Resistor	.21
R7	63-1835	15K ohm 1/2 W 20% Ins. Resistor	.21
R3	63-1838	18K ohm 1/2 W 10% Ins. Resistor	.21
R12	63-1841	22K ohm 1/2 W 10% Ins. Resistor	.21
R10	63-1849	33K ohm (in I.F.) 1/2 W 20% Ins. Resistor	.21
R5	63-1855	47K ohm 1/2 W 10% Ins. Resistor	.21
R21	63-1856	47K ohm 1/2 W 20% Ins. Resistor	.21
R1, R4) R14,R15)	63-1891	330K ohm 1/2 W 20% Ins. Resistor	.21
R9	63-1912	1 Megohm 1/2 W 20% Ins. Resistor	.21
R13	63-1961	15 Megohm 1/2 W 20% Ins. Resistor	.21
R2,R11 R16	63-2067	Volume Control - Tone Control & Switch.	3.01
		MISCELLANEOUS	
	19-87	Cable Retaining Clip	.01
	19-166	Coil Mtg. Clip (or 19-181) (used on S-16128)	.06
	19-193	Dial Glass Retaining Clip (2 used)	.02
	27-87	Silver Mica Disc (2 used)	.03
	49-606	6"x9" Oval P.M. Speaker (Rear Seat)	7.75
		208-606 Cone & Voice Coil	2.63
SK1	49-672	6" P.M. Speaker	7.00
		208-672 Cone & Voice Coil	2.09
	52-486	Battery Cable (Set to Fuse)	.30
	52-542	Speaker Cable	.45
	54-34	#6-32x1/4"x3/32" Hex. Nut Steel N.P. (1 ea. used 78-406-80-276)	.01
C25,C26	57-1054	Capacitor Plate (Spark Plate) (2 used)	.10
	74-53	Speaker Screen	.50
	74-54	Speaker Screen (rear seat)	.90
FS2	78-406	Foot Switch Cable Plug Socket	.12
	78-559	Antenna Connector Socket	.18
	78-596	Loktal Base Tube Socket	.18
	78-804	Vibrator Socket	.20
	78-833	Speaker Plug Socket	.15
	83-1681	Rubber Strip (Top Cover) (2 used)	.01
	93-125	#6 Int. Shakeproof Lockwasher #1206 (1 ea. used 78-406 - 80-276)	.01
	93-297	1/32"x.136x3/8" Washer Steel (used on 57-1054)	.01
	93-456	Vibrator Cushion Washer	.02
	93-686	Insulating Shoulder Washer	.02
T3	95-1028	Output Transformer	2.65
T4	95-1065	Power Transformer	7.25
	97-378	Set Mounting Stud (2 used)	.01
	110-135	Grille Cloth (Front Speaker)	.10
	114-49	#6-32x5/8 Hex. Hd M.S. Steel N.P. (1 ea. used 78-406 80-276)	.01
	114-199	#6x3/16" Hex. Hd. Sl. S.T. Screw Cad. Pl. (32 used)	.01
	188-115	Speaker Trim Ring	1.00
	188-117	Speaker Trim Ring (Rear)	2.75
V1	190-20	Vibrator	4.15

DIAG. NO.	PART NO.	DESCRIPTION	PRICE
	192-128	Dial Glass	.15
	202-759	Instruction Book (Owners Manual)	.10
FS3	S-14607	Foot Switch Assembly	3.00
	S-16136	Top Cover & Bushing Assy.	.70
	S-16141	Bottom Cover, Label & Washer Assy.	.70
	S-16139	Receiver Case Assembly	
	S-16187	Antenna Skt.,Brkt.Assy.	

DIAL & TUNING ASSEMBLY

	26-426	Dial Scale	1.40
	56-281	Pointer Guide Pin	.05
	57-1584	Escutcheon	1.40
	57-1618	Dial Scale Background Plate	.50
	59-231	Dial Pointer	.25
	59-232	Manual - Automatic Indication Flag	.25
	78-867	Dial Light Socket	.11
	80-141	Dial Light Socket Spring	.01
	80-766	Pointer Guide Rod Tension Spring	.05
	80-767	Pointer Drive Brkt. Tension Spring	.05
	80-768	Pointer Drive Bearing Spring	.01
	80-769	Pointer Link Tension Spring	.04
	80-772	Indicator Spring	.07
	100-36	Dial Light Bulb (Mazda #44)	.09
	S-16130	Pointer Drive Link, Spring & Stud Assembly	.10
	S-16131	Pointer Guide Link & Bushing Assembly.	.55
	S-16132	Pointer Mtg. Brkt. & Stud Assy	.15
	S-16134	Indicator Flag Assembly	.50
	S-16145	Dial Light Socket & Wire Assy	.30
	S-16154	Dial Scale Brkt. & Bumper Strip Assy.	.25

INSTALLATION KIT

	52-485	Battery Cable (Fuse to Ammeter)	.50
	54-30	#8-32x5/16x7/64 Hex. Nut Steel N.P. (8 used)	.01
	54-103	#10-24x3/8x1/8" Hex. Nut Steel Cad. Pl. (2 used)	.01
	54-301	9/16-24x3/4x3/32 Hex Nut Steel Cad. Pl.	.03
	68-16	#6 Allen Set Screw Wrench	.10
	93-126	#8 Int. Shakeproof Lockwasher #1208 (8 used)	.01
	93-127	#10 Int. Shakeproof Lockwasher #1210 (2 used)	.01
	93-719	.03x3/16"x7/16" Steel Washer Cad. Pl. (8 used)	.01
	93-1021	.029x32/64"x7/8" Steel Washer Cad. Pl. (2 used)	.02
	112-799	#8-32x3/4" Countersunk Oval Ha. M.S. Steel-Satin Chrome Finish (4 used)	.03
	114-315	#10x1/2"lg.x9/32" A.F. Hex. Hd. Sl. Sheet Metal Screw Cad. Pl. (3 used)	.02
F1	136-12	20 Amp. Fuse	.12
	S-16142	Installation Kit Assembly (Complete)	1.25

DIAG. NO.	PART NO.	DESCRIPTION	PRICE

MOTOR NOISE SUPPRESSION KIT

	22-920	Generator Capacitor	.45
	22-1326	Ignition Coil Capacitor	.58
	63-1046	Distributor Suppressor	.31
	80-145	Motor Hood Bond Spring	.02
	83-1446	Bonding Strip	.20
	112-746	#7x1/2" F.H. Sheet Metal Screw Type A Cad. Pl.	.02
	S-14822	Motor Noise Suppression Kit (Complete)	1.80

KNOB KIT

	46-825	Tone Control Knob	.40
	46-826	Dummy Trim Knob	.45
	S-16143	Tuning & Vol. Control Knob & Set Screw (73-69) (2 used)	.90
	S-16144	Knob Kit Assy. (Complete)	2.65

SPEAKER VOLUME CONTROL KIT ASSEMBLY

	52-453	Speaker Control Cable	.25
	54-153	#7/16-28x19/32x.120 Hex.Nut Steel Cad. Pl.	.04
	54-302	Speaker Control Trim Nut	.20
	63-2071	Dual Speaker Vol. Control	3.01
	S-16194	Speaker Vol. Control & Cable Assy.	3.25
	S-16166	Speaker Control Knob & Set Screw (73-130 & 46-827)	.45
	S-16195	Speaker Vol. Control Kit Assy. (Complete)	4.00

TUNER ASSEMBLY

	12-1680	Guide Rod Bracket	.20
	34-132	Indexing Disc	.02
	34-158	Ratchet Gear	.34
	34-198	Tuning Gear	.30
	56-127	1/16"x3/8" Groove Pin (Type 1)	.02
	57-1077	Protector Plte	.02
	57-1587	Front Mtg. Plate	.12
	76-378	Guide Rod	.10
	80-329	Gear Indexing Spring	.03
	80-331	Cross Arm Return Spring	.06
	80-332	Cam Lever Spring	.03
	80-336	Ratchet Gear Return Spring	.01
	80-341	Kick-Off Spring	.01
	80-774	Shaft Return Spring (Manual)	.02
	80-775	Shaft Return Spring (Automatic)	.02
S1	85-475	Solenoid Switch	.70
	93-631	Retaining Washer (2 used)	.01
	94-438	Cylindrical Spacing Bushing	.12
	94-601	Iron Core Insulating Bushing	.13
	99-19	Automatic Turret Stop (5 used)	.10
	99-20	Manual Turret Stop	.10
	112-657	Manual Turret Screw	.60
	112-725	Automatic Turret Screw (5 used)	.30

G.	PART NO.	DESCRIPTION	PRICE
	128-57	Indicator Cam	.02
	147-126	Gear & Disc. Spacer	.04
	149-70	Adjusting Spring & Core (3 used)	.53
	188-130	Switch Bushing Retaining Ring	.02
	S-10826	Solenoid End Plug & Brkt Assy.	.30
	S-10829	Solenoid & Terminal Assy.	.79
	S-13536	Turret Assembly	2.65
	S-13996	Ratchet & Bracket Assy.	.65
L2, L3, L5	S-14177	Osc. & R.F. Coil & Shield Assy.	2.10
	S-16147	Push-Pull Tuner Assy.(Complete)	15.00
	S-16176	Tuning Shaft & Gear Assy.	.50
	S-16178	Mtg. Plate & Retain. Strip Assy	.25
	S-16179	Cross Arm Assembly	.75
	S-16180	R.F. Coil & Shield Assy.	1.50
	S-16181	Switch Bush. & Contact Disc Assy.	.20

PARTS LIST MODEL GN596 NO. A.C. 150-2

AG.	PART NO.	DESCRIPTION	PRICE
		COILS & CHOKES	
	20-213	Main Hash Choke Coil	.36
	95-1134	1st I.F. Trans. Assy.	1.60
	95-1193	2nd I.F. Trans. Assy.	1.70
	S-8819	Antenna Motor Noise Choke Assy.	.40
	S-13999	Motor Noise Choke Coil Assy.	.35
	S-16282	Osc. Series Coil Assy.	.30
	S-16369	B+Choke Coil Assy.	.40
	S-16370	Osc. Shunt Coil Assy.	.80
		CONDENSERS	
2,C13	22-3	.01 Mfd. Ceramic (Disc) (or 22-1170) 500 V.	.26
	22-4	.004 Mfd. Ceramic(Disc) (or 22-906) 500 V	.26
	22-162	100 Mmfd. (Molded) 500V	.20
	22-170	.1 Mfd. (or 22-1748) 400V	.26
1	22-182	220 Mmfd. (Molded) 500V	.26
	22-250	.05 Mfd. (or 22-1778) 200V	.20
0	22-1270	.02 Mfd. (22-1781) 200V	.20
4,)		(Elect. Cond. 10 Mfd. 300V	
5,C16)	22-1387	(20 Mfd. 350 V 20 Mfd. (25V	1.45
,C5	22-1680	Two SectionTrimmer (Osc. & Converter)	.60
8) (	22-1728	.5 Mfd. 100V	.55
0) (			
	22-1849	.0047 Mfd. (Molded) 22-1022) 600V	.26
	22-2148	Antenna Trimmer	.50
7	22-2149	.0027 Mfd. 1600 V	1.00
	22-2150	240 Mmfd. Compensating	.26
		RESISTORS	
3	63-1620	1800 ohm 2W 10% Ins.Res.	.36
2	63-1621	270 ohm 1W 10% Ins.Res.	.24
	63-1624	15K ohm 2W 10% Ins.Res.	.36
6	63-1719	27 ohm1/2W 10%Ins.Res.	.21
4,R15	63-1740	82 ohm 1/2W 10%Ins.Res	.21
	63-1744	100 ohm 1/2W 20%Ins.Res	.21
	63-1841	22K ohm 1/2W 10%Ins.Res	.21
	63-1848	33K ohm 1/2W 10%Ins.Res.	.21
7	63-1856	47K ohm 1/2W 20%Ins.Res.	.21
,R10)			
1)	63-1891	330K ohm 1/2W 20%Ins."	.21
	63-1912	1 Megohm 1/2W 20%Ins."	.21
	63-1961	15 " 1/2W 20% Ins.Res.	.21
	63-2090	Volume Control & Switch	

DIAG. NO.	PART NO.	DESCRIPTION	PRICE
		MISCELLANEOUS	
	19-87	Cable Retaining Clip	.01
	19-166	Coil Mtg.Clip (or 19-181) (used on S-16370)	.06
	19-193	Dial Glass Retaining Clip (2 used)	.02
	27-87	Silver Mica Disc.	.03
	49-672	6" P.M.Speaker	7.00
		208-672 Cone &Voice Coil	2.09
	52-486	Battery Cable (Set to Fuse)	.30
	52-542	Speaker Cable	.45
	57-1054	Spark Plate	.10
	73-33	#6-32x5/16 Hex.Hd. Set Screw Cuppoint (used on S-16395)	.03
	73-69	#6-32x5/16 Allen Hd.Set Screw Cuppoint (2 used on knobs)	.09
	74-53	Speaker Screen	.50
	78-559	Antenna Connector Socket	.18
	78-596	Loktal Base Tube Socket (4 used)	.18
	78-804	Vibrator Socket	.20
	78-817	Miniature Tube Socket	.20
	78-833	Speaker Plug Socket	.15
	83-1680	Rubber Strip (Top Cover) (2 used)	.20
	93-686	Insulat.Shoulder Washer	.02
T4	95-1203	Power Transformer	4.50
T3	95-1209	Output Transformer	2.10
	110-135	Grill Cloth	.10
	114-199	#6x3/16"Hex Hd.Sl.S.T. Screw (32 used)	.01
	149-62	Iron Core & Screw	.10
	188-115	Speaker Trim Ring	1.00
V1	190-24	Vibrator	4.15
	192-131	Dial Glass	.15
	202-769	Instruction Book	.15
	S-16136	Top Cover & Bush.Assy.	.70
	S-16389	Bottom Cover,Label & Washer Assy.	.60
		DIAL ASSEMBLY	
	12-1701	Pointer Drive Brkt.	.05
	56-281	Pointer Guide Pin	.05
	57-1584	Escutcheon	1.40
	57-1621	Dial Scale Backgrd Plate	.15
	80-141	Dial Light Socket Sprg	.01

DIAG. NO.	PART NO.	DESCRIPTION	PRICE
	80-766	Pointer Guide Rod Tension Spring (Holds 56-281)	.05
	80-768	Pointer Drive Bearing Spring	.01
	80-797	Pointer Drive Brkt Tension Spring	.05
	93-922	Spring Washer (used on S-16396)	.02
	100-36	Dial Light Bulb - Mazda #44	.09
	S-16132	Pointer Mtg. Brkt. & Stud Assem.	.15
	S-16145	Dial Light Socket & Wire	.30
	S-16390	Pointer Drive Link, Sprg & Stud Assem.	.15
	S-16395	Tuning Gear, Bushing & Set Screw Assem.	.30
	S-16396	Tuning Shaft & Gear Assy	.25
	S-16618	Dial Scale & Brkt Assy.	1.30
	S-16622	Pointer, Guide Link, Stud & Bushing Assy.	.50

TUNER ASSEMBLY

	54-34	#6-32x1/4"Hex Nut Steel N.P. (6 used)	.01
	93-35	.032x.144x3/8 Steel Washer N.P.	.01
	93-125	#6 Int. Shakeproof Lockwasher #1206 (6 used)	.01
	93-1028	Drive Gear Washer (2 used)	.07
	94-613	Iron Core Insulat.Bushing	.06
	125-67	Rubber Grommet (3 used)	.03
	149-94	Iron Core (3 used)	.35
	184-14	Steel Ball 1/8"Dia.(4 used)	.01
L2,L3	S-14227	R.F.Tuning Coil Assy. (2 used)	.90
L5	S-16699	Osc. Tuning Coil Assy.	.75
	S-16400	Manual Tuner Assy.	3.50
	S-16404	Coil Mtg. Plte & Brkt Assy	.55
	S-16405	Tuner Rack Brkt.& Plate Assy.	.15
	S-16406	Drive Gear & Shaft Assy.	.30

MOTOR NOISE SUPPRESSION KIT

22-920	Generator Capacitor	.45
22-1326	Ignition Coil Capacitor	.58
63-1046	Distributor Suppressor	.31
80-145	Motor Hood Bond Sprng	.02
83-1446	Bonding Strip	.20
112-746	#7x1/2" F.H.Sheet Metal Screw Type "A" Cad.Pl.	.02
S-14822	Motor Noise Suppression Kit (Complete)	1.80

KNOB KIT

46-826	Dummy Trim Knob (2 used)	.45
S-16143	Tuning & Vol. Control Knob & Set Screw Assy.(2 used)	.90
S-16402	Knob Kit Assy.(Complete)	2.75

DIAG; NO.	PART NO.	DESCRIPTION	PRICE

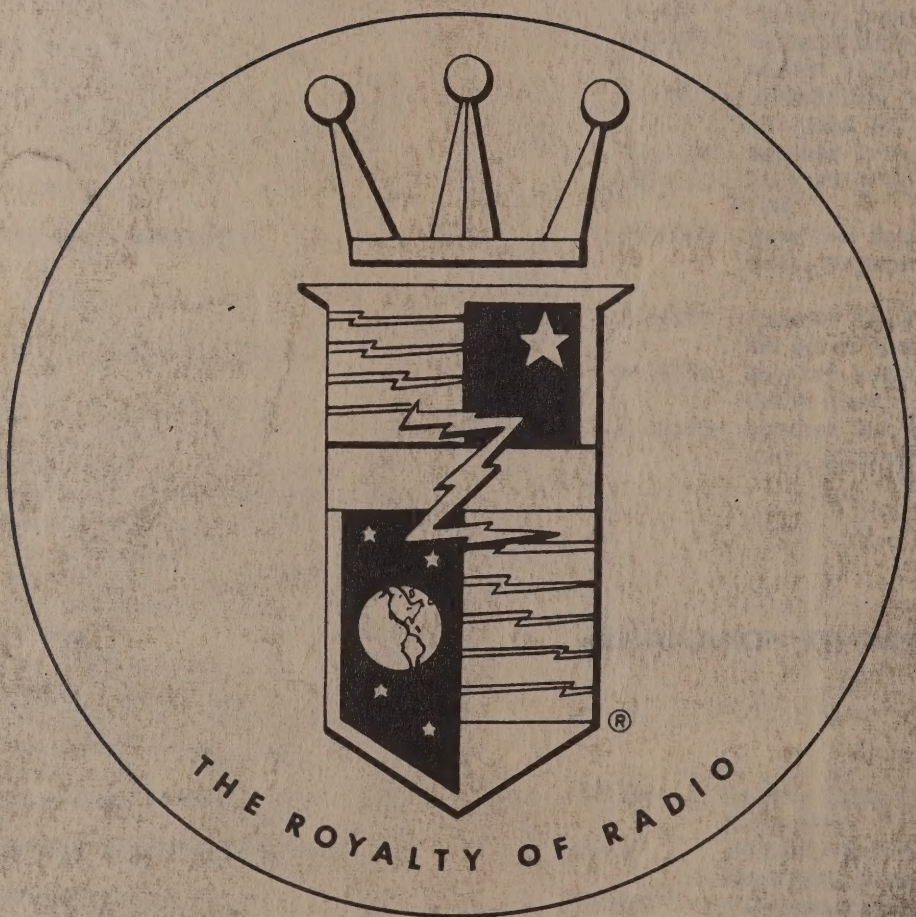
(OPTIONAL) REAR SEAT SPEAKER ASSEMBLY

49-606	6x9 P.M.Speaker	7.75
52-543	Speaker Control Cable	.25
52-571	Ext.Cable (Rear Seat Speaker)	.50
54-30	#8-32x5/16x7/64 Hex Nut Steel N.P. (4 used)	.01
54-153	7/16- 28x19/32x.120 Hex Nut Steel	.04
54-302	Speaker Control TrimNut	.20
63-2071	Dual Speaker Vol.Control	3.01
73-130	#6-32x5/32" Allen Hd. Set Screw (used on S-16166)	.08
74-54	Speaker Screen	.90
93-126	#8 Int. Shakeproof Lockwasher #1208 (4 used)	.01
93-719	.031x3/16x7/16 Steel Washer - Cad. Pl. (4 used)	.01
118-117	Speaker Trim Ring	2.75
202-791	Instruction Sheet (or 202-769)	.15
S-16000	Rear Seat Speaker Kit Assy. (Complete)	
S-16166	Speaker Control Knob & Set Screw Assy. (46-827)	.45
S-16194	Speaker Vol. Control & Cable Assy.	3.25
S-16195	Speaker Vol. Control Kit Assy. (Complete)	4.00

INSTALLATION KIT ASSEMBLY

52-550	Battery Cable (Fuse to Ammeter)	.40
54-30	#8-32x5/16x7/64 Hex.Nut Steel N.P. (4 used)	.01
54-103	#10-24x3/8x1/8 Hex. Nut Steel Cad. Pl. (2 used)	.01
68-16	#6 Allen Set Screw Wrench	.10
93-126	#8 Int.Shakeproof Lockwasher #1208 (4 used)	.01
93-127	#10 Int. Shakeproof Lockwasher #1210 (2 used)	.01
93-719	.031x3/16"x7/16" Steel Washer Cad. Pl. (4 used)	.01
93-1021	.029x37/64"x7/8" Steel Washer Cad. Pl. (2 used)	.02
112-739	#8-32x3/4" Countersunk Oval Hd. M.S. Steel (Satin Chrome (4 used)	.03
136-17	9 amp. Fuse	.12
S-16401	Installation Kit Assy.	.90

All prices shown are suggested list prices and subject to change without notice.



CPC 5M 49

Printed in U.S.A.